

CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report /
Environmental Impact Statement

Fresno to Bakersfield

CEQA Findings of Fact and Statement of Overriding Considerations

May 2014

as adopted by CHSRA Board on
May 7, 2014



CALIFORNIA
High-Speed Rail Authority



U.S. Department of Transportation
Federal Railroad Administration



**CEQA Findings of Fact and
Statement of Overriding
Considerations**

May 2014

Table of Contents

1.0	Introduction	1-1
2.0	Project Description	2-1
2.1	Background – Description of Statewide High-Speed Train System	2-1
2.1.1	Description of the Preferred Alternative, Downtown Fresno–Mariposa Station Location, Kings/Tulare Regional Station–East, and Bakersfield Hybrid Station Location	2-1
2.1.2	Description of the Portion of the Preferred Alternative to Be Approved and the Portion Reserved for a Future Decision	2-2
2.1.3	General Description of the HST System Infrastructure in the Fresno to Bakersfield Section	2-9
2.1.4	Project Design Features.....	2-9
3.0	Findings on Specific Impacts and Mitigation Measures.....	3-1
3.1	Transportation (Section 3.2 in the Final EIR/EIS)	3-1
3.1.1	TR IMPACT #12 - Loss of Property Access as a Result of Road Closures....	3-2
3.1.2	TR IMPACT #13 – HST Station Area (a) Roadway Segment and (b) Intersection Impacts	3-3
3.2	Air Quality and Global Climate Change (Section 3.3 in the Final EIR/EIS)	3-17
3.2.1	AQ IMPACT #1 - Regional Impacts – Construction of the HST Would Exceed the CEQA Emissions Threshold for VOC, NOx, PM10, and PM2.5	3-17
3.2.2	AQ Impact #2 - Compliance with Air Quality Plans	3-19
3.2.3	AQ Impact #3 - Regional Impacts – Material-Hauling Emissions Outside of San Joaquin Valley Air Basin (SJVAB)	3-20
3.2.4	AQ Impact #8 - Localized Air Quality Impacts from Concrete Batch Plants.....	3-21
3.3	Noise and Vibration (Section 3.4 in the Final EIR/EIS)	3-22
3.3.1	N&V IMPACT #2 - Construction Vibration During Pile Driving	3-23
3.3.2	N&V IMPACT #3 - Noise Impacts from Project Operation to Sensitive Receptors	3-24
3.3.3	N&V IMPACT #6 –Traffic Noise	3-26
3.4	Public Utilities and Energy (Section 3.6 in the Final EIR/EIS).....	3-26
3.4.1	Project Design Features.....	3-26
3.4.2	Impact PU&E # 5 –Conflicts with Existing Utilities	3-26
3.5	Biological Resources and Wetlands (Section 3.7 of the Final EIR/EIS).....	3-27
3.5.1	BIO IMPACT #1 – Construction Impacts on Special-Status Plant Species	3-27
3.5.2	BIO IMPACT #2 – Construction Impacts on Special-Status Wildlife Species.....	3-30
3.5.3	BIO Impact #3 – Construction Effects on Habitats of Concern	3-35
3.5.4	BIO Impact #5 – Project Effects on Special-Status Plant Species	3-39
3.5.5	BIO Impact #6 – Project Effects on Special-Status Wildlife Species	3-41
3.5.6	BIO Impact #7 – Project Effects on Habitats of Concern.....	3-44
3.5.7	BIO Impact #8 – Project Effects on Wildlife Movement Corridors	3-46
3.6	Hazardous Materials and Waste (Section 3.10 in the Final EIR/EIS).....	3-48
3.6.1	HMW IMPACT #4 - Temporary Hazardous Material and Waste Activities in the Proximity of Schools	3-49
3.7	Safety and Security (Section 3.11 in the Final EIR/EIS)	3-50
3.7.1	S&S IMPACT #10 – Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities.....	3-50
3.8	Socioeconomics and Communities (Section 3.12 in the Final EIR/EIS)	3-51
3.8.1	SO IMPACT #6 – Division of Existing Communities and Displacement of Facilities	3-51
3.8.2	SO IMPACT #7 – Effects to the Regional Agricultural Community	3-55

3.9	Station Planning, Land Use, and Development (Section 3.13 in Final).....	3-56
3.9.1	LU IMPACT #1 – Potential for Construction to Alter Land Use Patterns.....	3-56
3.9.2	LU IMPACT #2 – Permanent Conversion of Existing Land Uses to Transportation Use.....	3-59
3.9.3	LU IMPACT #3 – Land Use Effects of Parking Demand at Station Sites.....	3-61
3.9.4	LU IMPACT #4 – Indirect Effects on Surrounding Land Uses from HST Station	3-62
3.9.5	LU IMPACT #5 – Potential for Future Increased Density at HST Stations	3-62
3.10	Agricultural Lands (Chapter 3.14 of the Final EIR/EIS).....	3-63
3.10.1	AG IMPACT #4 - Permanent Conversion of Agricultural Land to Nonagricultural Use.....	3-63
3.10.2	AG IMPACT#6 - Effects on Land under Williamson Act or FSZ Contracts, Local Zoning, or Conservation Easement Lands.....	3-64
3.11	Parks, Recreation, and Open Space (Section 3.15 in the Final EIR/EIS)	3-66
3.11.1	PK IMPACT #1 – Common Aesthetic and Visual Quality Construction Impacts on Parks, Recreation, Open-Space Impacts, and School District Recreation Facilities	3-66
3.12	Aesthetics and Visual Resources (Section 3.16 in the Final EIR/EIS)	3-67
3.12.1	AVR IMPACT #2 –Construction Impact on Existing Visual Quality	3-67
3.12.2	AVR IMPACT #3 –Construction Impacts from Light and Glare	3-68
3.12.3	AVR IMPACT #4 – Lower Visual Quality in the Rural Valley/Agricultural Landscape Unit	3-68
3.12.4	AVR IMPACT #4 – Lower Visual Quality in the Wasco and Shafter Landscape Units	3-72
3.12.5	AVR-IMPACT #4 – Traction Power Distribution Facilities Would Alter Visual Character or Block Views	3-73
3.12.6	AVR IMPACT #4 – Sound Barriers Would Lower Visual Quality or Block Views	3-73
3.13	Cultural and Paleontological Resources (Section 3.17 in the Final EIR/EIS)	3-74
3.13.1	CUL IMPACT #1 - Potential Adverse Effects on Archaeological Resources Caused by Construction Activities.....	3-75
3.13.2	CUL IMPACT #2 – Potential Adverse Effects on Historic Architectural Resources due to Construction Activities.....	3-78
3.13.3	CUL IMPACT #3 - Potential Adverse Effects on Paleontological Resources Due to Construction Activities	3-83
3.14	Regional Growth (Section 3.18 in the Final EIR/EIS).....	3-84
4.0	Cumulative Impacts (Section 3.19 of the Final EIR/EIS)	4-1
4.1	Transportation	4-1
4.2	Air Quality and Global Climate Change	4-1
4.3	Noise and Vibration.....	4-2
4.4	Biological Resources and Wetlands.....	4-4
4.5	Socioeconomics and Communities.....	4-7
4.6	Station Planning, Land Use, and Development	4-8
4.7	Agricultural Lands	4-9
4.8	Aesthetics and Visual Resources.....	4-9
4.9	Cultural and Paleontological Resources.....	4-10
5.0	Feasibility of Potential Alternatives	5-1
5.1	Alternatives Considered in the Project EIR/EIS and Not Selected for Approval.....	5-3
5.1.1	The No Project Alternative.....	5-4
5.1.2	Hanford Area Alternatives.....	5-4
5.1.3	Corcoran Area Alternatives	5-5
5.1.4	Allensworth Area Alternatives	5-6
5.1.5	Wasco-Shafter Area Alternatives	5-6

5.1.6	Station Alternatives	5-7
5.2	Alternatives Suggested by Commenters.....	5-7
5.3	Alternatives Previously Considered and Not Carried Forward for Study in the EIR/EIS	5-11
5.4	Preferred Alternative	5-12
5.5	Conclusion on Alternatives.....	5-12
6.0	Mitigation Measures Suggested by Commenters.....	6-1
7.0	Statement of Overriding Considerations	7-1
7.1	General Findings on Significant and Unavoidable Impacts Associated with the Preferred Alternative North of 7 th Standard Road	7-1
7.2	Overriding Considerations for the Preferred Alternative, the Portion of the Preferred Alternative North of 7 th Standard Road, and the High-Speed Train System	7-3
7.2.1	Benefits of the Preferred Alternative as a Whole and the Portion of the Preferred Alternative North of 7 th Standard Road	7-3
7.2.1.1	Provides the First Test Track in the United States for Testing Very High Speed Train Vehicles	7-3
7.2.1.2	Provides an Essential Building Block to Establish Very High-Speed Passenger Service	7-4
7.2.1.3	Provides a Valuable Transportation Asset for Potential Use By Conventional Rail	7-4
7.2.1.4	Provides Economic and Employment Benefits from Construction	7-4
7.2.1.5	Summary of Benefits of Preferred Alternative as a Whole and Portion of Preferred Alternative North of 7 th Standard Road	7-5
7.2.2	Benefits of the Fresno to Bakersfield Section as Part of the Statewide High- Speed Train System	7-5
7.2.2.1	Transportation Benefits	7-6
7.2.2.2	Environmental Benefits.....	7-7
7.2.2.3	Consistency with State Policies in Executive Order S-3-05, Assembly Bill 32 and Senate Bill 375	7-7
7.2.2.4	Land Use Planning Benefits.....	7-8
7.2.2.5	Economic and Social Benefits.....	7-9
7.2.2.6	Benefits Will Accrue More Slowly Under The Phased Implementation Approach in the Authority's Business Plans, But Will Still be Significant Benefits and They Will Build Over Time	7-10
8.0	References	8-1

Attachments

- A Project Design Features
- B Noise and Vibration Mitigation Guidelines
- C Mitigation Measures: Construction Noise and Vibration
- D Highlighted Version of Appendix 3.7-A
- E Highlighted Version of Appendix 3.7-B
- F Full Text of Biological Resources Mitigation Measures

Tables

Table 3.1.2-1 Mitigation Measures for Roadway Segment Impacts Near the Fresno Station	3-5
Table 3.1.2-2 Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station	3-9
Table 3.1.2-3 Mitigation Measures for Intersection Impacts Near the Kings/Tulare Region Station-East	3-16

Figures

Figure 1 California HST System Initial Study Corridors Selected at Conclusion of Tier 1 EIR/EIS Processes	2-3
Figure 2 Fresno to Bakersfield Section Preferred Alternative	2-4
Figure 3 Fresno Station Alternative.....	2-5
Figure 4 Kings/Tulare Regional Station-East Preferred Alternative.....	2-6
Figure 5 Bakersfield Station-Hybrid Preferred Alternative	2-7
Figure 6 Portion of the Preferred Alternative to Be Approved	2-8

Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
AB 32	Assembly Bill 32
ADRP	Archaeological Data Recovery Program
AQMD	air quality management district
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
ATP	Archaeological Treatment Plan
Authority	California High-Speed Rail Authority
BETP	Built Environment Treatment Plan
BMP	best management practice
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CIDH	cast-in-drilled hole
CO	carbon monoxide
CRAA	California Relocation Assistance Act
CSLC	California State Lands Commission
CTS	California tiger salamander
CVFPB	Central Valley Flood Protection Board
dB	decibel(s)
dBA	A-weighted decibel(s)
EIR	environmental impact report
EIS	environmental impact statement
EMF	electromagnetic field
EMI	electromagnetic interference
ERA	environmentally restricted area
ESA	environmentally sensitive area
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GC	general conformity
GHG	greenhouse gas
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HALS	Historic American Landscape Survey
HST	high-speed train
IBC	International Building Code
ICS	Initial Construction Segment
IOS	Initial Operating Segment
in/sec	inch(es)/second
L _{dn}	day-night sound level, dBA
LEDPA	least environmentally damaging practicable alternative
LOS	level of service
MMRP	Mitigation Monitoring and Reporting Program
MOA	memorandum of agreement
MOWF	maintenance-of-way facility
mph	mile(s) per hour
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NPS	National Park Service
NRHP	National Register of Historic Places

O ₃	ozone
PA	programmatic agreement
PM ₁₀	particulate matter smaller than or equal to 10 microns in diameter
PM _{2.5}	particulate matter smaller than or equal to 2.5 microns in diameter
PRMMP	Paleontological Resource Monitoring and Mitigation Plan
PRM	paleontological resources monitor
PRS	paleontological resources specialist
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SB 375	Senate Bill 375
SCAG	Southern California Association of Governments
SCS	Sustainable Community Strategy
SHPO	State Historic Preservation Officer
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SJVR	San Joaquin Valley Railroad
SOI	Secretary of the Interior
SCAQMD	South Coast Air Quality Management District
SR	state route
SVP	Society of Vertebrate Paleontology
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air containment
TOD	transit-oriented development
U.S. EPA	U.S. Environmental Protection Agency
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
V/C	volume to capacity
VERA	Voluntary Emissions Reduction Agreement
VMT	vehicle miles traveled
VOC	volatile organic compound

1.0 Introduction

These California Environmental Quality Act (CEQA) Findings of Fact and Statement of Overriding Considerations are intended to fulfill the responsibilities of the California High-Speed Rail Authority (Authority) under CEQA for its project approval for the Fresno to Bakersfield Section of the California High-Speed Train (HST) System. CEQA provides that no public agency shall approve a project or program, as proposed, if it would result in significant environmental effects as identified in an EIR, unless it adopts and incorporates feasible mitigation to avoid and reduce such effects and adopts appropriate findings.

Section 15091 of the CEQA Guidelines provides as follows:

- (a) No public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. The possible findings are:
 - (1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.
 - (2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
 - (3) Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

CEQA Guidelines section 15093 further provides:

- (a) CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable."

These findings include a description of the Preferred Alternative for the Fresno to Bakersfield section, a description of the portion of the Preferred Alternative that the Authority will approve now and that portion the Authority reserves to a future decision, findings concerning potentially significant environmental impacts and mitigation to address such impacts, a discussion of cumulative and growth-inducing impacts, and a statement of overriding considerations.

The custodian of the documents and other materials that constitute the record of proceedings upon which these CEQA findings of fact and statement of overriding considerations are based is the California High-Speed Rail Authority, 770 L Street, Suite 800, Sacramento, California 95814, (916) 324-1541.

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2.0 Project Description

2.1 Background – Description of Statewide High-Speed Train System

The Authority has responsibility for planning, designing, constructing, and operating the California HST System. Its mandate is to develop a high-speed rail system in coordination with the state's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports.

The California HST System will provide intercity, high-speed service on more than 800 miles of track throughout California, connecting the major population centers of Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. The Authority and FRA prepared two first-tier environmental impact report/environmental impact statement (EIR/EIS) documents to select preferred alignments and station locations to advance for more detailed study in second-tier EIRs/EISs. Figure 1 shows the statewide HST System resulting from the first-tier EIRs/EISs and first-tier decisions. The HST System will use state-of-the-art, electrically powered, high-speed, steel-wheel-on-steel-rail technology, including contemporary safety, signaling, and automated train-control systems, with trains capable of operating up to 220 miles per hour (mph) over a fully grade-separated, dedicated guideway alignment.

The Authority plans two phases: Phase 1 (to be built in stages depending on funding availability) will connect San Francisco to Los Angeles/Anaheim via the Pacheco Pass and the Central Valley with a mandated express travel time of 2 hours and 40 minutes, or less; Phase 2 will connect the Central Valley to the state's capital, Sacramento, and extend the system from Los Angeles to San Diego. Consistent with its first-tier decisions, the Authority has divided the HST System into nine individual sections for more detailed, second-tier analysis. In 2012, following certification of a second-tier Final EIR, the Authority selected an alignment and station locations for the Merced to Fresno section of the HST System. The Fresno to Bakersfield Section is the second of the nine individual sections to complete second-tier environmental review.

2.1.1 Description of the Preferred Alternative, Downtown Fresno–Mariposa Station Location, Kings/Tulare Regional Station–East, and Bakersfield Hybrid Station Location

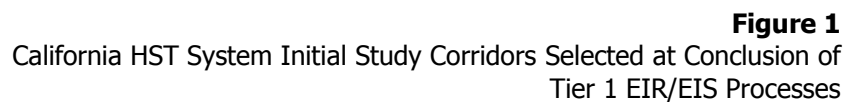
As shown in Figure 2, from north to south, the Fresno to Bakersfield Preferred Alternative as described in the Final EIR/EIS would follow the BNSF Alternative from the northern end of the Fresno Station tracks to East Kamm Avenue in Fresno County. At East Kamm Avenue, the Preferred Alternative would continue along the BNSF Alternative–Hanford East to the Kings/Tulare Regional Station–East Alternative. From the Kings/Tulare Regional Station–East Alternative, the Preferred Alternative would follow the BNSF Alternative–Hanford East Alternative to just north of Nevada Avenue where it would transition to the Corcoran Bypass Alternative and travel east of the city of Corcoran. North of Avenue 136 in Tulare County, the Corcoran Bypass Alternative would then transition back to the BNSF Alternative. The Preferred Alternative would follow the BNSF Alternative in a southeasterly direction through Tulare County until transitioning to the Allensworth Bypass Alternative at Avenue 84. The alignment would pass west of the Allensworth Ecological Reserve and Colonel Allensworth State Historic Park and then transition to the BNSF Alternative–Through Wasco-Shafter in the vicinity of Taussig Avenue in Kern County. The alignment would continue through Kern County until Hageman Road where the Preferred Alternative would transition to the Bakersfield Hybrid Alternative to the Bakersfield Hybrid Station and its terminus at Oswell Street.

Chapter 7 of the Fresno to Bakersfield Section Final Project EIR/EIS also describes the Downtown Fresno Station, the Kings/Tulare Regional Station–East Alternative, and the Bakersfield Hybrid Station Alternative as the preferred alternatives, as shown in Figures 3 through 5.

The Preferred Alternative does not include a preferred heavy maintenance facility (HMF) site. The Authority, along with the Federal Railroad Administration, anticipate considering the HMF sites evaluated in the Merced to Fresno Final EIR/EIS along with the five HMF sites evaluated in the Fresno to Bakersfield Final EIR/EIS prior to making a determination on one or more preferred sites, and prior to making a final HMF decision. The impacts of an HMF are therefore not addressed further in these findings.

2.1.2 Description of the Portion of the Preferred Alternative to Be Approved and the Portion Reserved for a Future Decision

As shown in Figure 6, the portion of the Preferred Alternative that the Authority will approve in conjunction with these findings extends from Monterrey Street in the City of Fresno to 7th Standard Road in Kern County. The northern limit of the approval in the City of Fresno does not include the Fresno Mariposa Station area, which the Authority previously approved in 2012 with Resolution HSRA# 12-20. The southern limit of the approval is at 7th Standard Road in Kern County. The Authority is intentionally reserving a decision on the alignment south of 7th Standard Road in Kern County and into the City of Bakersfield to a future proceeding.



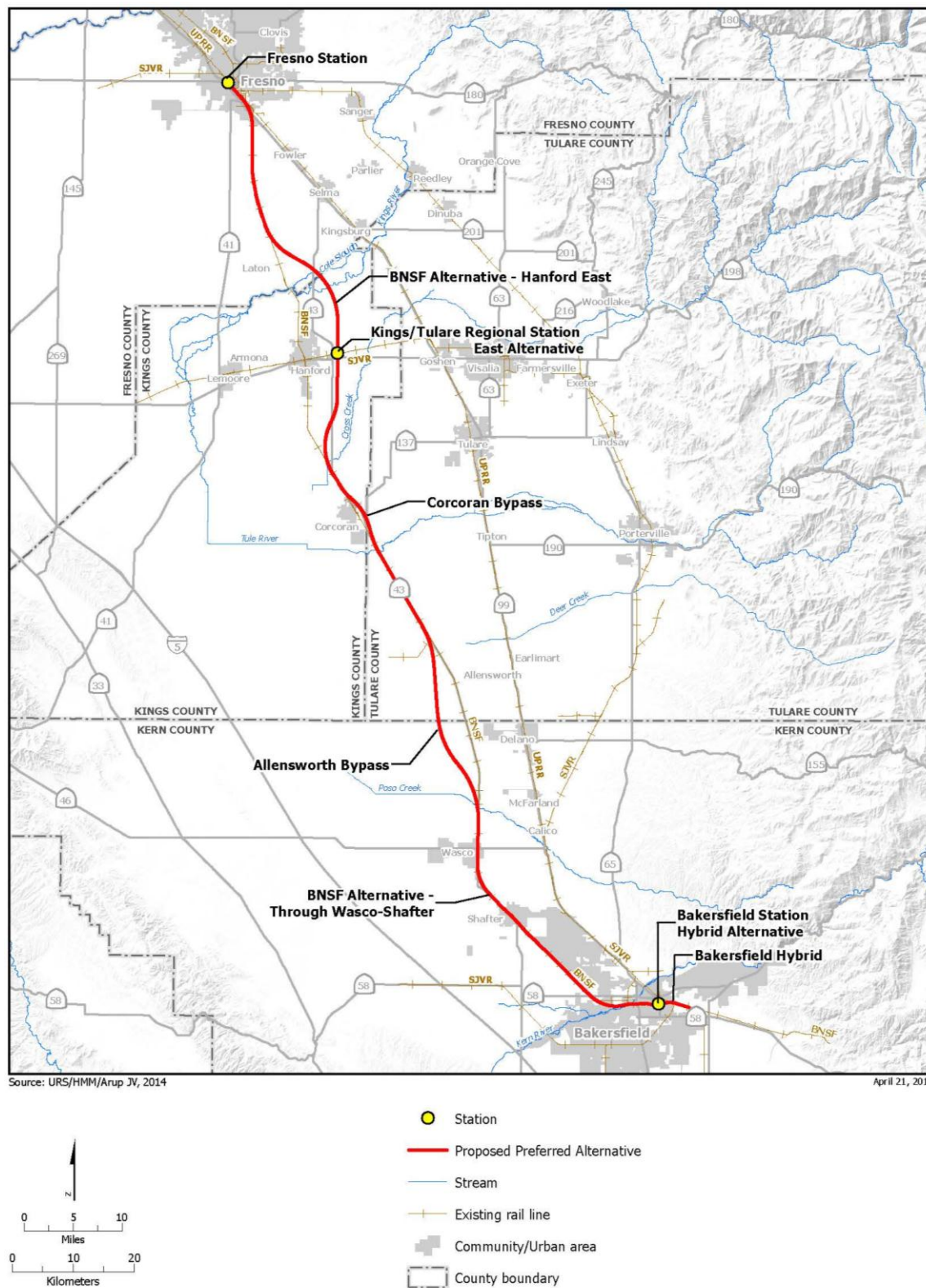


Figure 2
Fresno to Bakersfield Section Preferred Alternative

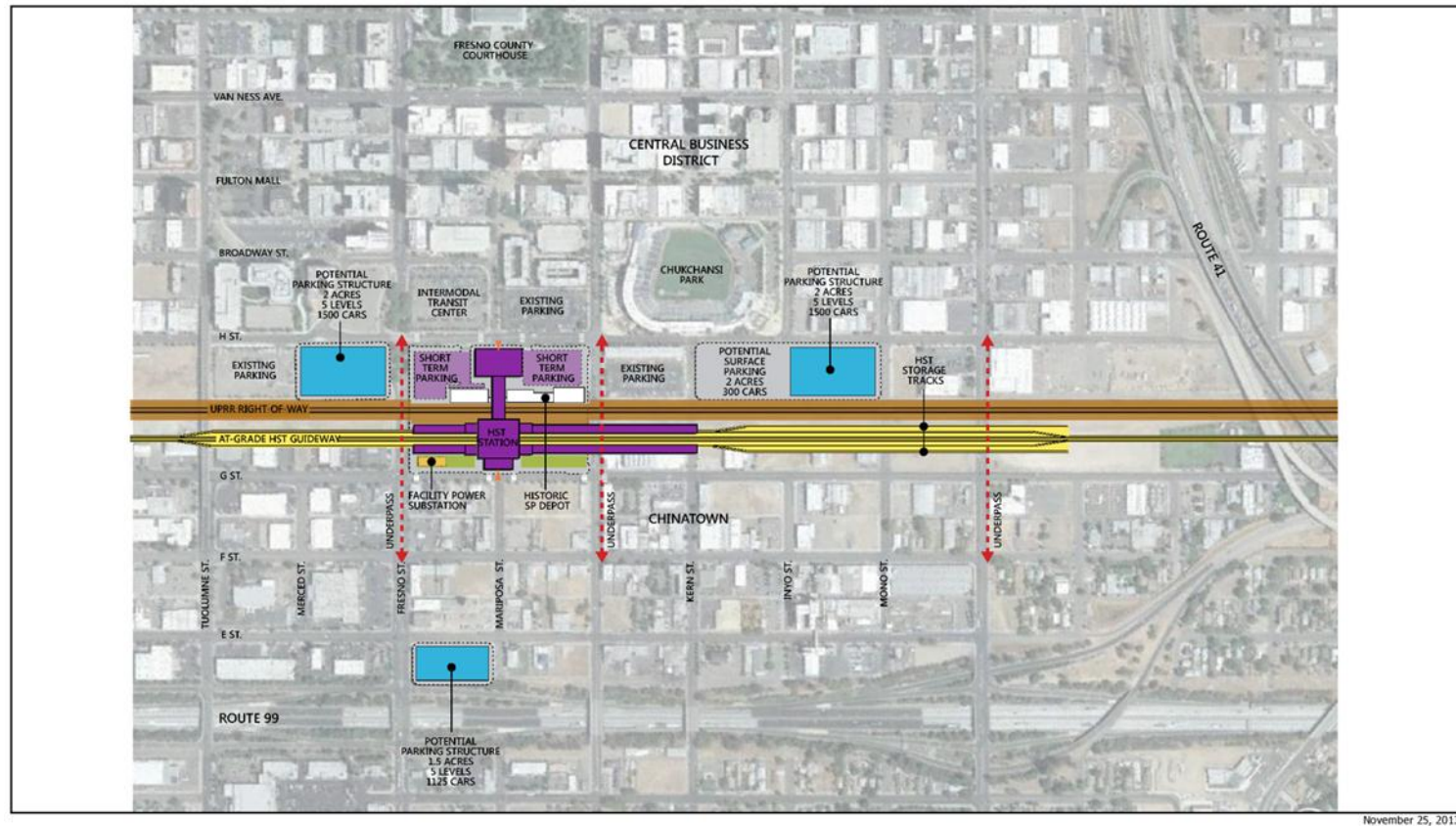


Figure 3
Fresno Station Alternative

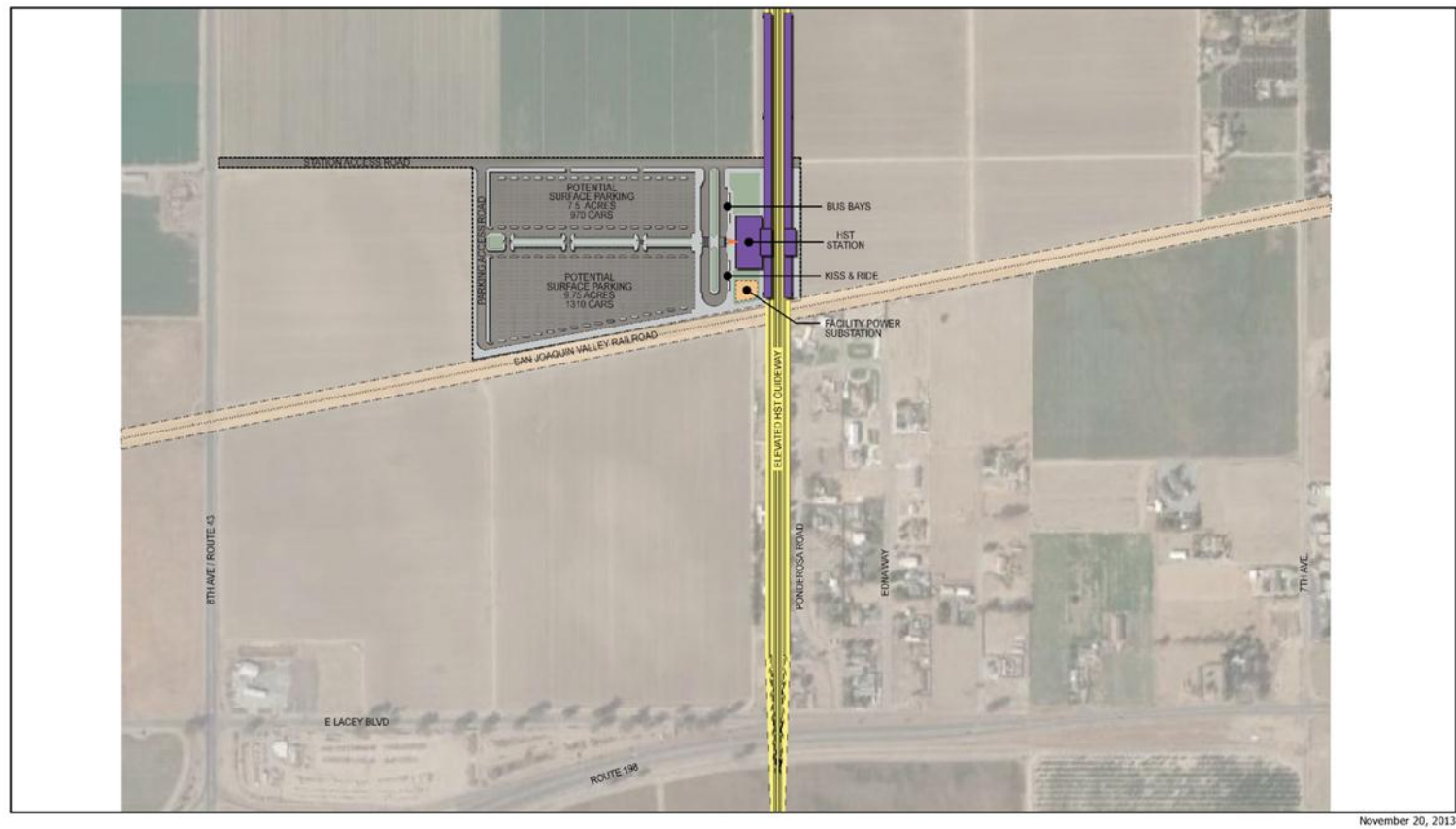


Figure 4
Kings/Tulare Regional Station–East Preferred Alternative

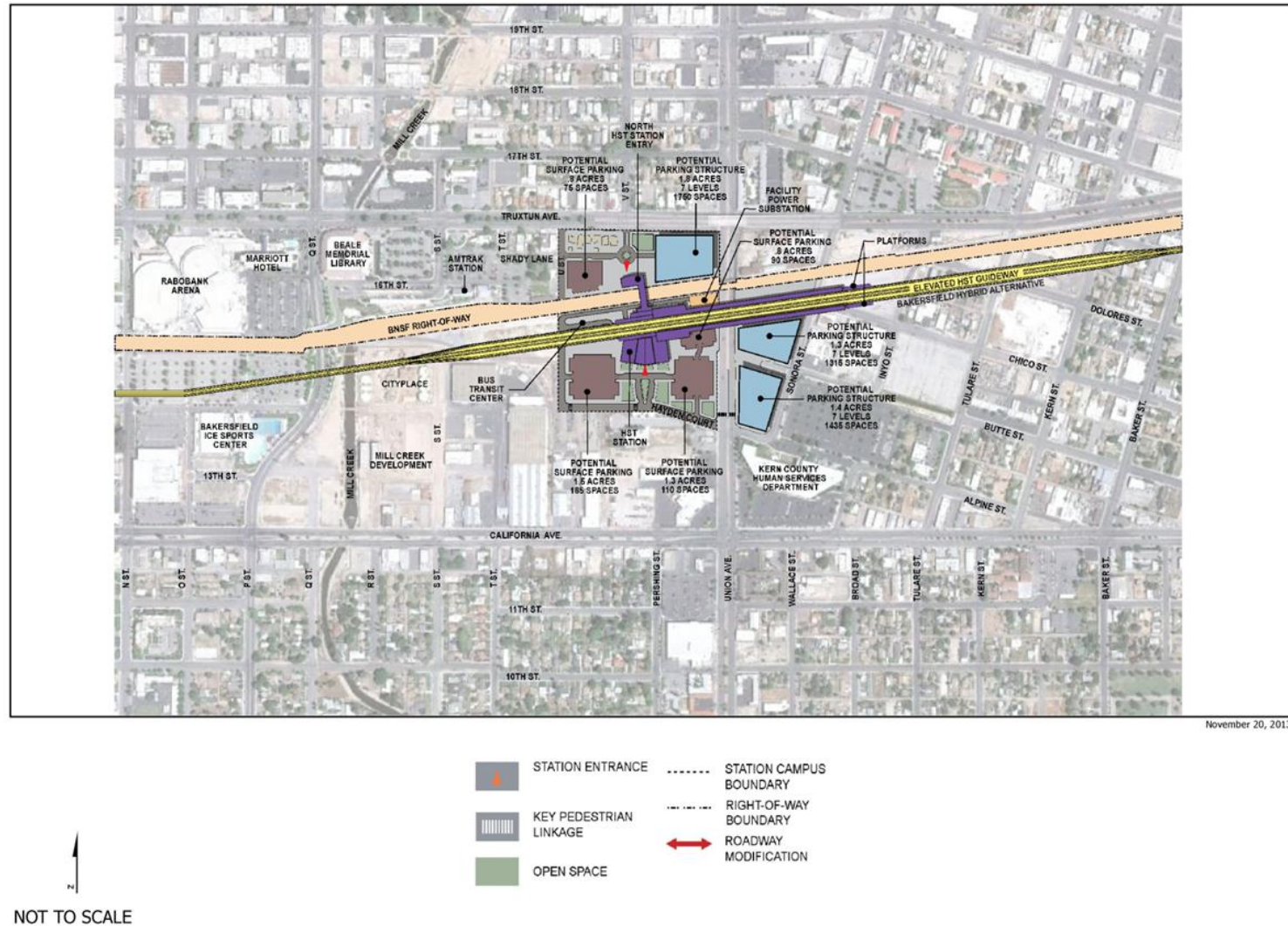


Figure 5
Bakersfield Station—Hybrid Preferred Alternative

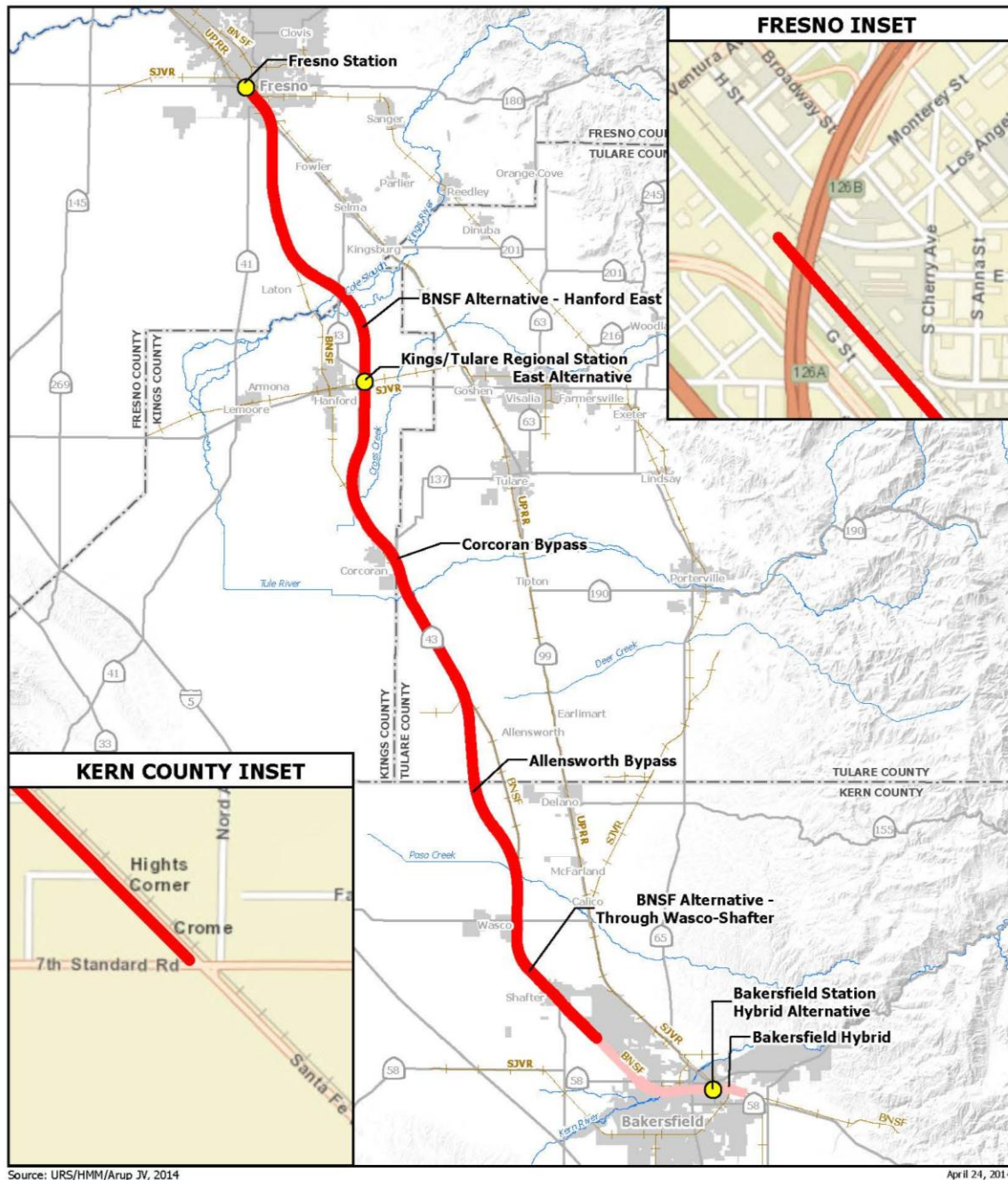


Figure 6
Portion of the Preferred Alternative to Be Approved

2.1.3 General Description of the HST System Infrastructure in the Fresno to Bakersfield Section

Chapter 2 of the Fresno to Bakersfield Section Final Project EIR/EIS describes the general components of HST System infrastructure that are part of, and included in, this Fresno to Bakersfield Section.

System Design Performance, Safety, and Security: The HST would be a fully grade-separated and access-controlled guideway with intrusion-detection and monitoring systems. All aspects of the HST System will conform to federal requirements regarding transportation security and safety.

Train Vehicles: Train vehicles, although not selected as part of this project, are anticipated to be an electric multiple unit (EMU) concept with a computer-based automatic train-control system.

Stations: Stations include station platforms and trackway, arrival and departure facilities, and parking. Three stations are proposed for the Fresno to Bakersfield Section, one in the city of Fresno, the Kings/Tulare Regional station in the Hanford/Visalia/Tulare area, and one in the city of Bakersfield.

Track: The HST track would travel from Fresno to Bakersfield, mostly along existing transportation corridors, as depicted in Chapter 2. The track, or guideway, includes multiple different vertical profiles, as described in Chapter 2.

Grade Separations: The HST would be fully grade-separated from all crossing traffic through roadway overcrossings or undercrossings, or through elevation of the HST.

Traction Power Distribution: The Fresno to Bakersfield Section includes a traction power distribution system allowing trains to draw electric power from a catenary system fed through an overhead contact system. The catenary system consists of a series of mast poles with contact wires suspended from the mast poles. The catenary system will be connected to traction power substations spaced at approximately 30-mile intervals. Switching and paralleling stations will be required at approximately 15-mile intervals, at the midpoint between the traction power substations. Signaling and train-control elements include small huts within the right-of-way that house signal relay and microprocessor components and related equipment.

Track Structure: HST track would be constructed with ballast and ties, with continuous welded rail, for all at-grade sections. Slab construction would be used for elevated structures exceeding 1,000 feet in length where operating speeds are planned for 220 mph.

Maintenance Facilities: A maintenance-of-way facility would provide for equipment, materials, and replacement parts storage, and support quarters and staging areas for HST System maintenance personnel. A heavy-vehicle maintenance and layover facility is also under consideration for the Fresno to Bakersfield Section, but is not proposed for final approval at this time.

2.1.4 Project Design Features

The Fresno to Bakersfield project description incorporates many design features and best management practices (BMPs) that are identified in the Final Project EIR/EIS and included in detail in the technical reports. As a result of applying these design features and BMPs as part of the project itself, the project will avoid significant impacts in several resource areas, including electromagnetic fields and electromagnetic interference (EMI/EMF), hydrology and water resources, geology and soils, and hazardous materials and wastes. In addition, the regulatory

requirements for many activities provide additional assurance that significant impacts to the environment will not occur.

The applicable regulatory requirements and project design features that are considered a part of the project are described for the following issue areas in more detail in the corresponding chapters of the Final Project EIR/EIS and are also listed in Attachment A:

- Transportation – Sections 3.2.2 and 3.2.6.
- Air Quality and Global Climate Change – Sections 3.3.2 and 3.3.8.
- Noise and Vibration – Sections 3.4.2 and 3.4.6.
- Electromagnetic Fields and Electromagnetic Interference – Sections 3.5.2 and 3.5.6.
- Biological Resources and Wetlands – Sections 3.7.2 and 3.7.6.
- Hydrology and Water Resources – Sections 3.8.2 and 3.8.6.
- Geology and Soils – Sections 3.9.2 and 3.9.6.
- Hazardous Materials and Wastes – Sections 3.10.2 and 3.10.6.
- Safety and Security – Sections 3.11.2 and 3.11.6.
- Socioeconomics, Communities, and Environmental Justice – Sections 3.12.2 and 3.12.6.
- Station Planning, Land Use, and Development – Sections 3.13.2 and 3.13.6.
- Agricultural Lands – Sections 3.14.2 and 3.14.6.
- Parks, Recreation, and Open Space – Sections 3.15.2 and 3.15.6.
- Aesthetics and Visual Resources – Sections 3.16.2 and 3.16.6.
- Cultural and Paleontological Resources – Section 3.17.2.
- Regional Growth – Section 3.18.2.
- Cumulative Impacts – Section 3.19.2.

These project design features are an enforceable component of the project description and their implementation will be monitored and reported on in conjunction with project monitoring.

3.0 Findings on Specific Impacts and Mitigation Measures

The environmental effects of the Preferred Alternative and station locations for the entire Fresno to Bakersfield HST section that would be potentially significant are described in Chapter 3 of Volume 1 of the Final Project EIR/EIS. These impacts are set forth and summarized below for the Preferred Alternative north of 7th Standard Road, along with mitigation measures the Authority adopts, that will avoid or substantially lessen those potentially significant or significant impacts. The impact and mitigation measure findings below depend upon and therefore incorporate by reference the full analysis and conclusions contained within the Final Project EIR/EIS.

Also set forth in these findings are those impacts that the Authority finds cannot with certainty be avoided or reduced to a less-than-significant level even with the adoption of all feasible mitigation measures proposed in the Final Project EIR/EIS. In adopting these findings and mitigation measures, the Authority also adopts a Statement of Overriding Considerations. The Statement of Overriding Considerations describes the economic, social, and other benefits of the Preferred Alternative that will render these significant unavoidable environmental impacts acceptable.

The Authority is not required to make findings or adopt mitigation measures or policies as part of this decision for impacts that are less-than-significant or beneficial. The resource areas that include one or more less-than-significant impacts without mitigation, or beneficial impacts, include:

- Transportation
- Air Quality and Global Climate Change
- Noise and Vibration
- Electromagnetic Fields and Electromagnetic Interference
- Public Utilities and Energy
- Biological Resources and Wetlands
- Hydrology and Water Resources
- Geology, Soils, and Seismicity
- Hazardous Materials and Wastes
- Safety and Security
- Socioeconomics, Communities, and Environmental Justice
- Station Planning, Land Use, and Development
- Agricultural Lands
- Parks, Recreation, and Open Space
- Aesthetics and Visual Resources
- Cultural and Paleontological Resources
- Cumulative Impacts

3.1 Transportation (Section 3.2 in the Final EIR/EIS)

As described in the Final EIR/EIS (Section 3.2.5), transportation impacts of the HST construction and station construction period (*i.e.* they will end when construction ends) will be less than significant (Final EIR/EIS, pp. 3.2-87 through 3.2-92, Impacts TR #1 through TR #9). This conclusion is supported, in part, by the Project Design Features that the Authority has incorporated into the Project, consistent with and in furtherance of the Statewide Program EIR/EIS commitments. (See Attachment A; see also Final EIR/EIS, Section 3.2.6, Project Design Features.) In adopting the resolution of approval of the project, the Authority confirms that the Design Features identified in Attachment A are part of the project.

For operational impacts (*i.e.*, impacts that are permanent due to re-direction of existing traffic because of permanent network road changes required by the alignment construction and impacts

that are permanent due to traffic generated at HST stations from their operation for HST), all impacts will be reduced to less than significant levels with the implementation of mitigation.

3.1.1 TR IMPACT #12 - Loss of Property Access as a Result of Road Closures

The Preferred Alternative north of 7th Standard Road would result in changes to the roadway and highway network between Fresno and 7th Standard Road near the Kern County line. The changes could include permanent limitations/reductions in property access that property owners/users currently have. Because of these potential property access issues (i.e., potential to result in lack of property access), the road closure effects on the loss of property access would have a significant impact.

TR-MM#1: Access Maintenance for Property Owners. If a proposed permanent road closure restricts current access to a property, the Authority will provide alternative access via connections to existing roadways. If adjacent road access is not available, the Authority will prepare new road connections, if feasible. Alternative access shall maintain the viability of the property use as it was used prior to the initiation of HST project construction. If alternative road access is not feasible for a permanent loss of property access, the property will be acquired by the Authority.

This mitigation measure would be effective, given the listed approaches available to address all potential scenarios encountered. Impacts associated with permanent road closures will be reduced to a less-than-significant impact with Mitigation Measure TR MM#1.

Implementation of Mitigation Measure TR-MM#1 could result in secondary effects. If the project requires the replacement of property access due to a permanent loss from the project, mitigation may result in impacts on the physical environment. Those impacts would include emissions and fugitive dust from construction equipment, construction-related noise, construction-related road closures or traffic delays and impacts on biological and cultural resources that may be present on the site of the new property access route. Any new or expanded roadways would be designed and constructed to be consistent with local land use plans if feasible and with the avoidance and minimization measures and construction period mitigation measures discussed in Section 3.2, Transportation; Section 3.3, Air Quality and Global Climate Change; Section 3.4, Noise and Vibration; Section 3.7, Biological Resources; and Section 3.17, Cultural and Paleontological Resources. For this reason, it is expected that the impacts of mitigation would be less than significant.

If the only need for mitigation is the purchasing of the property by the Authority, this mitigation measure would result in no physical impacts except potential impacts if the property use and facilities change as a result of the lack of access. Such changes and potential impacts are too speculative to analyze at this point.

The Authority finds that mitigation measures have been required in the project that will mitigate or avoid the significant impact related to loss of property access as a result of road closures. The Authority further finds that mitigation measures have been required in the project that will mitigate or avoid the significant secondary effects of implementation of Mitigation Measure TR-MM-#1.

3.1.2 TR IMPACT #13 – HST Station Area (a) Roadway Segment and (b) Intersection Impacts

For traffic congestion operational impacts¹ (*i.e.*, impacts that are permanent due to re-direction of existing traffic because of network road changes required by the alignment construction and impacts that are permanent due to traffic generated at HST stations from their operation for HST), as described in Section 3.2.3 of the Final EIR/EIS, the traffic analysis was performed using a dual baseline approach to comply with recent court requirements. The dual approach compares project traffic to existing traffic (Existing Plus Project), and compares project traffic to traffic modeled to be present in the “background” in 2035 (based on regional growth without HST) (Future [2035] Plus Project). The Final EIR/EIS set forth mitigation measures for both scenarios, but mitigation for all impacts under both scenarios is not required (see Final EIR/S pg. 3.2-124). These are simply two different analytical ways of evaluating the same potential impact.

For a project like the HST project that will take years from alignment construction start to full HST station operation, the dual baseline analysis framework is useful. By combining the analytics of the two approaches (see *Fresno to Bakersfield Section: Transportation Analysis Technical Report* (Authority and FRA 2014) and *Fresno to Bakersfield: Transportation Mitigation Methodology Memorandum* [URS/HMM/Arup Joint Venture, April, 2014]) incorporated herein by reference), one can distinguish traffic impacts that could occur (a) in the near term due to alignment construction only (which can create impacts due to permanent re-direction of existing traffic due to permanent re-configuration of the existing street network) from (b) impacts that will not occur until the future due to background cumulative traffic growth coupled with HST station traffic from (c) impacts that might occur at the same intersection at both points in time. With these distinctions, mitigation measures can be selected from the appropriate baseline scenario and assigned to each affected intersection and segment along with the required mitigation timing based on when the impact will occur. Mitigation for (a) impacts described above would be based on the Existing Plus Project baseline and would be required concurrent with alignment construction. Mitigation for (b) impacts described above would be based on the Future [2035] Plus Project baseline and would be required prior to the associated station opening. Mitigation for (c) impacts described above would be based on the both baselines, and would be required concurrent with alignment construction (e.g., adding a signal) then again prior to the associated station opening (e.g., adding turn lanes to the now-signalized intersection). This is detailed in the tables that follow and also in the Mitigation Monitoring and Reporting Program (MMRP) that accompanies these findings.

The combining analytical effort mentioned in the preceding paragraph resolved and normalized an inherent limitation of the court-mandated dual baseline approach for a project like HSR that could cause near-term impacts from one part (alignment construction) and future impacts from another part (station operation). The inherent limitation of the existing-plus-project approach is that it assumes that the HST station (with all of its associated vehicle traffic) becomes fully operational at maximum ridership effectively overnight, when that event will not occur until 2035; it also ignores that background traffic will grow and the roadway network will change based on programmed and funded RTP projects. It therefore presents a hypothetical scenario. See Final EIR/EIS pages 3.2-6 to 3.2-7. The inherent limitation of the Future [2035]-plus-project approach

¹ SB 743 (2013), codified as relevant in CEQA at Public Resources Code section 21099(b)(2), requires the CEQA Guidelines to be amended (likely in 2014) to include alternative direction to the traditional LOS/delay metric for evaluating transportation impacts. “Upon certification of the guidelines..., automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment [under CEQA], except in locations specifically identified in the guidelines, if any.” Development of these Guidelines amendments is under way (see *Preliminary Evaluation of Alternative Methods of Transportation Analysis*, Governor’s Office of Planning and Research, Dec. 30, 2013). Because the Guidelines are not in effect yet, the Authority makes these findings related to LOS/delay but does not waive the benefit of SB 743 and the amended Guidelines once they become operative.

is that it can mask that portions of the HST project (i.e., alignment construction that will permanently re-direct existing traffic) would occur in the very near term which could cause traffic impacts. By combining the analytics of the two approaches (see *Fresno to Bakersfield: Transportation Mitigation Methodology Memorandum* (Joint/Venture, April, 2014)), the Authority resolved these inherent limitations. That effort involved additional sensitivity modeling, based on the existing dual-baseline information, to determine which intersections and segments would be impacted by construction of the alignment alone and which intersections and segments would be impacted by construction of the alignment *plus* HST station traffic. These findings and associated MMRP reflect the product of that work and require only the mitigation that is necessary to mitigate the actual impacts when they occur and when from which aspect of the project.

(a) HST STATION AREA ROADWAY SEGMENT IMPACTS

Roadway segment analysis of AM and PM peak hours used the traffic impact criteria described in Section 3.2.3 of the Final EIR/EIS. Roadway segment scenarios are evaluated and compared for Existing Conditions, Future No Project (year 2035), and Future with Project (year 2035). Because the significance criteria focuses on roadways that are predicted to operate at Level of Service (LOS) E and F under project conditions, or are already operating at LOS E and F under pre-project conditions, only the roadways that meet those criteria are listed. All other roadways are and would continue to operate at LOS D or better under project conditions, are not significantly impacted, do not require mitigation, and are not listed. All roadways evaluated are included in the Fresno to Bakersfield Section: Transportation Analysis Technical Report (Authority and FRA 2012) and the Fresno to Bakersfield Section: Station Traffic Reanalysis Memo (URS/HMM/Arup Joint Venture 2014a).

An impact is considered significant for roadway segments that result in an increase in the V/C ratio of 0.04 or more with project-related traffic if operating without project-related traffic at LOS E or F. An impact is also considered significant under CEQA if the addition of project-related traffic results in a reduction in LOS below LOS D. Because traffic at these roadway segments (set forth below) would experience an unacceptable increase in traffic under one of the two above criteria, the impact would be significant.

Fresno Station

The addition of the HST project-generated traffic to the Fresno Station would not result in any significant impacts to roadway segments under Existing Plus Project conditions. The addition of the HST project-generated traffic to the Fresno Station would impact five (5) roadway segments in the Future (2035) Plus Project conditions.

- Stanislaus Street between Van Ness Avenue and O Street.
- Fresno Street between P Street and M Street.
- Tulare Street between R Street and U Street.
- Stanislaus Street between M Street and N Street.
- Van Ness Avenue south of Tuolumne Street.

TR MM#8: Add New Lanes to Roadway. Add additional roadway lanes to improve LOS and intersection operation.

Impacts may occur as a result of implementing Mitigation Measure TR MM#8, the location of these Mitigation Measures are depicted in the Fresno to Bakersfield Section: Roadway Modification Feasibility Memo (URS/HMM/Arup Joint Venture 2014b). The development footprint

mitigation measures to be implemented were overlaid over the existing inventory of agricultural, biological, geological, historical and cultural, recreation, and public utility resources, and over the socioeconomic and hazardous material data used for analysis in this Fresno to Bakersfield Section EIR/EIS to ensure that the potential impacts have been adequately analyzed. No significant impacts were determined to occur as a result of the construction and implementation of the mitigation measures described below. Road widening may result in the loss of existing on-street parking and Class II bikeways; however, the HST Authority will coordinate with local jurisdictions to ensure minimum parking requirements are met and non-vehicle transportation routes are maintained. Therefore, the secondary impacts of Mitigation Measure TR-MM#8 are less than significant.

The Authority finds that Mitigation Measure TR-MM#8 has been required in the project. To the extent implementation of Mitigation Measure TR-MM#8 lies within the responsibility or jurisdiction of another public agency, the Authority finds that the measures required by Mitigation Measure TR-MM#8 have been, or can and should be, adopted by that other agency. Implementation of Mitigation Measure TR-MM #8 will reduce the project's impacts associated with a reduction in roadway segment LOS to less than significant.

Table 3.1.2-1 presents the specific mitigation measures required for affected roadway segments located near the Downtown Fresno Station.

Table 3.1.2-1
Mitigation Measures for Roadway Segment Impacts Near the Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended; implement prior to Fresno HST station opening
7 – Stanislaus Street, between R Street and Van Ness Avenue	TR MM#8: Add New Lanes to Roadway.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the roadway to provide one additional lane in each direction.
14– Fresno Street, between P Street and M Street	TR MM#8: Add New Lanes to Roadway.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the roadway to provide one additional lane in each direction.
21 – Tulare Street, between R Street and U Street	TR MM#8: Add New Lanes to Roadway.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the roadway to provide one additional lane in each direction.
56 – Stanislaus Street, between M Street and N Street	TR MM#8: Add New Lanes to Roadway.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the roadway to provide one additional lane in each direction.
58 – Van Ness Avenue, south of Tuolumne Street	TR MM#8: Add New Lanes to Roadway.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the roadway to provide one additional lane in each direction.

Kings/Tulare Regional Station–East

The Final EIR/EIS concluded that the addition of HST project generated traffic to the Kings/Tulare Regional Station–East would significantly impact seven (7) roadway segments under the Existing Plus Project Conditions.² However, these impacts are the result of operational impacts associated with vehicles driving to the station (not due to alignment construction) and therefore the impacts would not come about until the Kings/Tulare Regional Station–East is operational. (See discussion above, and *Fresno to Bakersfield: Transportation Mitigation Methodology Memorandum* [URS/HMM/Arup Joint Venture, April, 2014]) Because the station will not be operational until well into the future, it is not appropriate to base mitigation upon the Existing Plus Project Scenario (these impacts in fact are not impacts because they represent a hypothetical scenario, as noted above). No roadway segments impacts are projected to occur for the Kings Tulare Regional Station–East under the Future (2035) plus Project scenario. Therefore, no mitigation measures are required.

(b) HST STATION AREA INTERSECTION IMPACTS

An impact is considered a significant impact under CEQA if:

- For intersections (signalized and unsignalized), the addition of project related traffic results in a reduction in LOS below D;
- For signalized intersections that are projected to operate at LOS E or F under baseline conditions, the addition of project-related traffic increases average delay at an intersection by 4 seconds or more;
- For unsignalized intersections projected to operate at LOS E or F under baseline conditions, the addition of project-related traffic increases delay by 5 seconds or more (measured as average delay for all-way stop and for worst movement for a multi-way stop intersection), and if the intersection satisfies one or more traffic signal warrants⁵ for more than one hour of the day.

With the addition of the HST project-generated traffic and the addition of project-related roadway network infrastructure modifications, the study intersections set forth below would experience a decrease in operational functionality that could violate one of the criteria above.

The following mitigation measures for the significantly impacted intersections listed below would be effective by providing improvements to mitigate impacted signalized and unsignalized intersections by returning the intersection to LOS D (if the intersection was operating at LOS D or better pre-project) or to the pre-project condition (if the intersection was operating at LOS E or F pre-project). Impacts associated with reduction in signalized and unsignalized intersection LOS will be reduced to a less than significant impact with implementation of TR-MM#2 through TR-MM#7.

TR MM#2: Modify Signal Phasing. Modify traffic signal phasing sequence to improve operations and signalized intersection, in consultation with the appropriate jurisdiction to ensure the peak hour re-timing of the signal.

TR MM#3: Add Signal to Intersection to Improve LOS/Operation. Add traffic signals to affected non-signalized intersections surrounding proposed HST station locations to improve LOS

² Specifically: SR 198 between SR 198 ramps and 7th Avenue; SR 198 between 7th Avenue and 6th Avenue; SR 198 between 6th Avenue and 2nd Avenue; SR 198 between 2nd Avenue and Road 48; SR 198 between Road 48 and Road 56/17th Avenue; SR 198 between Road 56/17th Avenue and County Road 60; SR 198 between County Road 60 and County Road J/25/Road 68.

and intersection operation. Prior to the completion of roadway mitigation measure improvements, the Authority shall install a traffic signal at impacted intersections. The mitigation summary shown in Table 3.1.2-2 indicates any locations where this mitigation would be justified.

TR MM#4: Restripe Intersections. Restripe specific intersections surrounding proposed HST station locations to improve LOS and intersection operations. Prior to the completion of civil work, the Authority shall install a traffic signal. The mitigation summary shown in Table 3.1.2-2 indicates any locations where this mitigation would be justified.

TR MM#5: Revise Signal Cycle Length. Revise signal cycle length at specific intersections surrounding proposed HST station locations to improve LOS and intersection operations. Prior to the completion of civil work, the Authority shall coordinate with the appropriate jurisdiction to ensure the peak hour re-timing of the signal. The mitigation summary shown in Table 3.1.2-2 indicates any locations where this mitigation would be justified.

TR MM#6: Widen Approaches to Intersections. Widen approaches to improve LOS and intersection operation. Prior to the completion of civil work, the Authority shall construct improvements. The mitigation summary shown in Table 3.1.2-2 indicates any locations where this mitigation would be justified.

TR MM#7: Add Exclusive Turn Lanes to Intersections. Add exclusive turn lanes at specific intersections to improve LOS and intersection operations. Prior to the completion of civil work, the Authority shall construct improvements. The mitigation summary shown in Table 3.1.2-2 indicates any locations where this mitigation would be justified.

Mitigation Measures TR MM#2 to MM#5 generally would involve little to no physical disturbance that could cause any impacts. Modifying signal phasing and revising signal cycle length is done electronically to the existing signals. Restriping intersections generally involves just painting existing pavement. Adding signals to existing intersections generally would be done within the existing pavement or disturbed graded right-of-way. For these reasons, impacts from these mitigation measures would be less than significant,

Impacts may occur as a result of implementing Mitigation Measures TR MM#6 and TR MM#7; the location of these Mitigation Measures are depicted in the Fresno to Bakersfield Section: Roadway Modification Feasibility Memo (URS/HMM/Arup Joint Venture 2014b). The development footprint mitigation measures to be implemented were overlaid over the existing inventory of agricultural, biological, geological, historical and cultural, recreation, and public utility resources, and over the socioeconomic and hazardous material data used for analysis in this Fresno to Bakersfield Section EIR/EIS to ensure that the potential impacts have been adequately analyzed. No significant impacts were determined to occur as a result of the construction and implementation of the mitigation measures described below.

The Authority finds that Mitigation Measures TR-MM#2 through TR-MM#7 have been required in the project and that implementation of these mitigation measures will reduce the HST station area intersection impacts of the project to less than significant. To the extent that implementation of Mitigation Measure TR-MM#2 through TR-MM#7 lies within the responsibility or jurisdiction of another public agency, the Authority finds that such measures have been, or can and should be, adopted by that other agency. Implementation of Mitigation Measure TR-MM #2 through TR-MM#7 will reduce the project's impacts associated with a reduction in roadway segment LOS to less than significant.

Fresno Station

Reconfiguration of the Fresno-area road network caused by the alignment and the addition the HST project-generated traffic to the Fresno Station, as detailed below, would result in significant

impacts to Fresno intersections. As shown in Table 3.2-16 of the Final EIR/EIS, under Existing Plus Project scenario conditions, project traffic would significantly affect 13 intersections in the AM and/or PM³. Of these 13 intersections, seven were determined not to be impacted as a result of alignment construction (i.e., network changes due to alignment) and are only impacted when 2035 station and future traffic is added, so as explained above these seven intersection impact are hypothetical for this existing plus project scenario. Of the remaining six intersections, two were determined to be the result of alignment construction (i.e., network changes due to alignment) only and are not impacted when HST-station and future cumulative traffic is added; these intersections will be mitigated for based on the Existing Plus Project Conditions.⁴ The other four intersections are impacted as a result of alignment construction *and* also are impacted under the Future (2035) Plus Project scenario (i.e., network changes plus HST-station-generated traffic and cumulative traffic);⁵ these intersections will receive mitigation at the time of alignment construction based on the Existing Plus Project Conditions mitigation *and* also at the time of station opening based on Future (2035) Plus Project Conditions mitigation (in the case of two intersections,⁶ the existing plus project mitigation done with alignment construction also mitigates, in advance essentially, the future condition impacts). *Fresno to Bakersfield: Transportation Mitigation Methodology Memorandum* [URS/HMM/Arup Joint Venture, April, 2014]). All other impacted intersections in Fresno are impacted only in the future condition when HST station traffic and cumulative traffic are present and will be mitigated based on Future (2035) Plus Project Conditions mitigation. Table 3.1.2-2 presents mitigation measures for impacted intersections for the Fresno Station.

³ Specifically, the intersections of: Van Ness Avenue/SR 41 southbound ramp; SR 99 northbound ramps/Ventura Avenue; Divisadero St/SR 41 NB ramps/Tulare St; SR 99 southbound ramps/Fresno Street; Van Ness Avenue/Stanslaus Street; H Street/Divisadero Street; N. Blackstone Avenue/CA 180 westbound ramps; H Street/Ventura Street; Tuolumne Street/L Street; Stanislaus Street/N Street; W. Olive Avenue/SR 99 southbound ramps; W. Belmont Avenue/SR 99 southbound ramps; and W. Belmont Avenue/SR 99 northbound ramps. As explained above, this scenario is hypothetical

⁴ Specifically, the intersections of: Divisadero Street/SR 41 northbound ramps/Tulare Street and H Street/Divisadero Street. As explained above, analysis resolving and normalizing the two baseline scenarios (i.e., removing station-generated traffic from the existing plus project scenario) identified those intersections that would be impacted in the near-term by just alignment-caused network changes – a more realistic scenario.

⁵ Specifically, the intersections of: Van Ness Avenue/Stanslaus Street; N. Blackstone Avenue/CA 180 westbound ramps; H Street/Ventura Street; and Stanislaus St. N Street.

⁶ Specifically, the intersections of N. Blackstone Avenue/CA 180 westbound ramps and H Street/Ventura Street.

Table 3.1.2-2
Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
4 – Van Ness Ave/SR 41 SB Ramp	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install a traffic signal at the intersection prior to Fresno HST station opening.
6 – SR 99 NB Ramps/Ventura Ave	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install a traffic signal at the intersection prior to Fresno HST station opening.
7 – E St./Venture Avenue	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install a traffic signal at the intersection prior to Fresno HST station opening.
25 – H St./Tulare St.	TR MM#2: Modify Signal Phasing.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Re-time existing signal in the PM to 60 prior to Fresno HST station opening.
30 – U Street/Tulare Street	TR MM#6: Widen Approach to Intersections; TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install southbound left-turn lane. Restripe southbound shared through-/left lane to through-lane prior to Fresno HST station opening.
33-0 – Divisadero St/SR 41 NB Ramps/Tulare St.	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-39 Existing Plus Project Mitigation Measures – Fresno Station Area	Widen the westbound approach to provide one exclusive left-turn lane, two through-lanes, and one exclusive right-turn lane at the intersection concurrent with alignment construction.

Table 3.1.2-2
Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
37 – SR 99 SB Ramps/Fresno St.	TR MM#6: Widen Approaches to Intersections; TR MM#7 - Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the eastbound approach to provide two exclusive through-lanes and one exclusive right-turn lane at the intersection prior to Fresno HST station opening.
38 – SR 99 NB Ramps/Fresno St.	TR MM#4: Restripe Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Restripe westbound right-turn lane to a shared through-/right-turn lane prior to Fresno HST station opening.
42 – Van Ness Avenue/Fresno Street	TR MM#4: Restripe Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install southbound right lane, restripe shared southbound lane to southbound through-lane prior to Fresno HST station opening.
46 – Fresno St./Divisadero St.	TR MM#4: Restripe Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install westbound left-turn lane and restripe shared through-/left lane to through-lane prior to Fresno HST station opening.
52 – E Street/Stanislaus St.	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the eastbound approach to provide one exclusive left-turn lane, one exclusive through-lane, and one exclusive right-turn lane at the intersection prior to Fresno HST station opening.

Table 3.1.2-2
Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
53 – Broadway St. Stanislaus St.	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the eastbound approach to provide one exclusive left-turn lane, one exclusive through lane, and one exclusive right-turn lane at the intersection prior to Fresno HST station opening.
54 – Van Ness/Avenue/Stanislaus St.	TR MM#5: Revise Signal Cycle Length. TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-39 Existing Plus Project Mitigation Measures – Fresno Station Area Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Re-time the existing signal in PM to 60 concurrent with alignment construction. Prior to Fresno HST station opening, widen the westbound approach to provide one exclusive left-turn lane, one exclusive through-lane, and one shared through-/right-turn lane at the intersection.
55 – N. Blackstone Ave./Stanislaus St.	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the westbound approach to provide one exclusive left-turn lane, one exclusive through lane, and one shared through-/right-turn lane at the intersection prior to Fresno HST station opening.
63 – H St./Divisadero St.	TR MM#5: Revise Signal Cycle Length	Table 3.2-39 Existing Plus Project Mitigation Measures – Fresno Station Area	Re-time the existing signal in AM to 120 concurrent with alignment construction.

Table 3.1.2-2
Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
74 – N. Blackstone Ave./E. Belmont Ave.	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install eastbound right-turn lane. Restripe shared southbound through-/left-turn to left-turn lane. Restripe shared southbound through-right lane to through-lane. Install southbound right-turn lane prior to Fresno HST station opening.
80 – N. Blackstone Ave./SR 180 westbound ramps	TR MM#4: Restripe Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-39 Existing Plus Project Mitigation Measures – Fresno Station Area Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Concurrent with alignment construction: (a) Restripe shared eastbound lane to eastbound through- and eastbound right-turn lane and (b) Restripe the eastbound approach to provide one exclusive left-turn lane and one shared left-turn/right-turn/through-lane at the intersection.
84 – G St./Mono	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Signalize intersection prior to Fresno HST station opening.

Table 3.1.2-2
Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
86 – H St/Ventura St.	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-39 Existing Plus Project Mitigation Measures – Fresno Station Area Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Signalize intersection concurrent with alignment construction.
90 – Broadway St./Santa Clara St.	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Signalize intersection prior to Fresno HST station opening.
92 – S. Van Ness Ave./E. California Ave.	TR MM#3: Add Signal to Intersection to Improve LOS/ Operation. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install a traffic signal at the intersection; also provide exclusive left-turn lanes in both northbound and southbound directions, and change phasing on the northbound left and southbound left to protected plus permissive prior to Fresno HST station opening.
96 – Golden State Blvd./E. Church Ave.	TR MM#2: Modify signal phasing. TR MM#6: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Provide an exclusive right-turn lane in the northbound direction, and change signal phasing on all approaches to provide a protected plus permissive left-turn phase prior to Fresno HST station opening.

Table 3.1.2-2
Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
101 – S. East Ave./Golden State Blvd.	TR MM#2: Modify signal phasing.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Increase cycle length in the PM Peak Hour prior to Fresno HST station opening.
102 – Golden State Blvd./E. Jensen Ave.	TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Provide an exclusive right-turn lane for both northbound and southbound approaches prior to Fresno HST station opening.
105 – Stanislaus St./ 99 SB Off	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the southbound approach to provide one shared left turn/throughlane and one exclusive right-turn lane at the intersection prior to Fresno HST station opening.
106 – Stanislaus St/99 NB On	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the southbound approach to provide one shared left turn/throughlane and one exclusive right-turn lane at the intersection prior to Fresno HST station opening.
111 – Stanislaus St./Fulton St.	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the southbound approach to provide one shared left turn/throughlane and one exclusive right-turn lane at the intersection prior to Fresno HST station opening.

Table 3.1.2-2
Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
115 – Stanislaus St./M St.	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen the southbound approach to provide one shared left- turn/throughlane, and one exclusive right-turn lane at the intersection prior to Fresno HST station opening.
117 – Stanislaus St./N. St.	TR MM#3: Add Signal to Intersection to Improve LOS/Operation. TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-39 Existing Plus Project Mitigation Measures – Fresno Station Area Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Concurrent with alignment construction, install a traffic signal at the intersection. Prior to station opening, widen the westbound approach to provide one exclusive left-turn lane, one exclusive through-lane, and one shared through-/right-turn lane at the intersection.
124 – West Olive Ave./SR 99 SB Ramps	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen southbound approach to provide an exclusive left-turn lane prior to Fresno HST station opening.
125 – West Olive Ave./SR 99 NB Ramps	TR MM#6: Widen Approaches to Intersections. TR MM#7: Add Exclusive Turn Lanes to Intersections.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Widen northbound approach to provide an exclusive left-turn lane prior to Fresno HST station opening.
129 – West Belmont Ave/SR 99 Southbound Ramps	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install traffic signal at the intersection prior to Fresno HST station opening.

Table 3.1.2-2

Mitigation Measures for Intersection Impacts Near the Downtown Fresno Station

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
130 – West Belmont Ave./SR 99 NB Ramps	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-40 Future (2035) Plus Project Mitigation Measures – Fresno Station Area	Install traffic signal at the intersection prior to Fresno HST station opening.

Kings/Tulare Regional Station—East

Although the Final EIR/EIS identified intersection impacts in the Kings/Tulare Regional Station—East vicinity, the *Fresno to Bakersfield: Transportation Mitigation Methodology Memorandum* (URS/HMM/Arup Joint Venture, April 2014) determined that no impacts to intersections within these station study areas would occur as a result of network changes due to the proposed HST alignment and related structures. Therefore, all mitigation measures are based on the Future (2035) Plus Project scenario, as shown in Table 3.1.2-3, below.

Table 3.1.2-3

Mitigation Measures for Intersection Impacts Near the Kings/Tulare Region Station—East

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
1 – Ninth Ave/SR 198	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-42 (Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station—East Alternative	Install a traffic signal at the intersection prior to KT HST station opening.
3 – SR 43/SR 198 Eastbound Ramps	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-42 (Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station—East Alternative	Install a traffic signal at the intersection prior to KT HST station opening.
4 – Seventh St/SR 198	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-42 (Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station—East Alternative	Install a traffic signal at the intersection prior to KT HST station opening.

Table 3.1.2-3
Mitigation Measures for Intersection Impacts Near the Kings/Tulare Region Station—East

Location Affected	Mitigation Measure(s)	Final EIR/EIS Table	Specific Actions Recommended
6 – Sixth St/SR 198	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-42 (Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station—East Alternative	Install a traffic signal at the intersection prior to KT HST station opening.
7 – Second Ave./SR 198	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-42 (Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station—East Alternative	Install a traffic signal at the intersection prior to KT HST station opening.
8 – SR 43/Lacey Blvd.	TR MM#3: Add Signal to Intersection to Improve LOS/Operation.	Table 3.2-42 (Future (2035) Plus Project Mitigation Measures – Kings/Tulare Regional Station—East Alternative	Install a traffic signal at the intersection prior to KT HST station opening.

3.2 Air Quality and Global Climate Change (Section 3.3 in the Final EIR/EIS)

Once operational, the HST will have a beneficial effect on air quality and greenhouse gas (GHG) emissions. (See Impacts AQ #10, AQ #11). Although construction of the project would result in air quality impacts, with implementation of the mitigation measures required for the project, each of these impacts would be reduced to less-than-significant levels. Further assuring that the project's air quality and GHG impacts will not be significant are the Project Design Features that the Authority has incorporated into the project, consistent with and in furtherance of the Statewide EIR/EIS commitments. (See Attachment A; see also Final EIR/EIS, Section 3.2.8, Project Design Features.) In adopting the resolution of approval of the project, the Authority confirms that the Project Design Features set forth in Attachment A are part of the project.

3.2.1 AQ IMPACT #1 - Regional Impacts – Construction of the HST Would Exceed the CEQA Emissions Threshold for VOC, NO_x, PM₁₀, and PM_{2.5}

Direct emissions from construction of the Preferred Alternative would exceed San Joaquin Valley Air Pollution Control District (SJVAPCD) thresholds for volatile organic compounds (VOCs), nitrogen oxide (NO_x), particulate matter smaller than or equal to 10 microns in diameter (PM₁₀),

and particulate matter smaller than or equal to 2.5 microns in diameter ($PM_{2.5}$) in some construction years. Specifically, VOC emission would exceed significance thresholds from 2014-2016 and NO_x emissions would exceed SJVAPCD thresholds from 2014-2018, and year 2021. PM_{10} emissions would exceed SJVAPCD thresholds in years 2014-2017 and $PM_{2.5}$ emissions would exceed SJVAPCD thresholds in 2015 and 2016. This is shown in Table 3.3-7 of the Final EIR/EIS based on calculation details supported by Appendix A of the Air Quality Technical Report (Authority and FRA 2014). This could cause violations of NO_x , ozone, PM_{10} , and $PM_{2.5}$ air quality standards or contribute substantially to NO_x , ozone, PM_{10} , and $PM_{2.5}$ existing or projected air quality violations. Construction emissions may also impede or obstruct implementation of the 8-hour SJVAPCD 2007 Ozone Plan, or the 2004 Extreme Ozone 1-hour Attainment Demonstration Plan, the 2007 PM_{10} Maintenance Plan, and the 2012 $PM_{2.5}$ Plan.

Exceeding or contributing to an exceedance of any air quality standard or contributing substantially to an existing or projected air quality violation is considered a significant impact. VOC, NO_x , PM_{10} , and $PM_{2.5}$ emissions during construction would exceed SJVAPCD thresholds, in the years noted, and the project may violate an air quality standard and/or contribute substantially to an existing or projected air quality violation for VOC, NO_x , PM_{10} , and $PM_{2.5}$ and therefore would be a significant impact.

AQ MM#1: Reduce Criteria Exhaust Emissions from Construction Equipment. This mitigation measure applies to heavy-duty construction equipment used during the construction phase. All off-road construction diesel equipment will use the cleanest reasonably available equipment (including newer equipment and/or tailpipe retrofits), but in no case less clean than the average fleet mix for the current calendar year, as set forth in California Air Resources Board's (CARB's) OFFROAD 2011 database and no less than a 40% reduction compared to a tier 2 engine standard for NO_x emissions. The Authority will require the contractor to document efforts it undertook to locate newer equipment (such as, in order of priority, Tier 4, Tier 3, or Tier 2 equipment) and/or tailpipe retrofit equivalents. The Authority will require the contractor to provide documentation to the Authority of such efforts, including correspondence with at least two construction equipment rental companies. A copy of each unit's certified tier specification and any required CARB or SJVAPCD operating permit will be made available at the time of mobilization of each piece of equipment. The Authority will require the contractor to keep a written record (supported by equipment hours meters where available) of equipment usage during project construction for each piece of equipment.

AQ MM#2: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment. This mitigation measure applies to all on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel. Material-hauling trucks will consist of an average fleet mix of equipment model year 2010, or newer, but no less than the average fleet mix for the current calendar year as set forth in CARB's EMFAC 2011 database. The Authority will require the contractor will provide documentation of efforts to secure such a fleet mix. The Authority will require the contractor to keep a written record of equipment usage during project construction for each piece of equipment.

AQ MM#4: Offset Project Construction Emissions through an SJVAPCD Voluntary Emission Reduction Agreement (VERA). This mitigation measure would address AQ Impact #1 (Common Regional Air Quality Impacts During Construction) that would exceed the GC applicability and CEQA emissions thresholds for VOC and NO_x , and the CEQA emission thresholds for PM_{10} and $PM_{2.5}$. The Authority and SJVAPCD will enter into a contractual agreement to mitigate (by offsetting) to net zero for all construction years the project's actual emissions from construction equipment and vehicle exhaust emissions of VOC, NO_x , PM_{10} , and $PM_{2.5}$. The agreement will provide funds for the district's Emission Reduction Incentive Program (SJVAPCD 2011) to fund grants for projects that achieve emission reductions, with preference given to highly impacted communities, thus offsetting project-related impacts on air quality. Projects

funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of old farm tractors. To lower overall cost, funding for the VERA program to cover estimated construction emissions for any funded construction phase will be provided at the beginning of the construction phase if feasible. At a minimum, funding shall be provided so that mitigation/offsets will occur in the year of impact, or as otherwise permitted by 40 C.F.R. Part 93 Section 93.163.

Implementation of these mitigation measures is not expected to result in secondary impacts.

With onsite mitigation (i.e., AQ-MM#1 and #2), VOC, NO_x, PM₁₀, and PM_{2.5} impacts would be reduced, but could remain significant. As stated in SJVAPCD 2012 Draft Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) (SJVAPCD 2012), purchase of offset emissions through a VERA with the SJVAPCD (mitigation measure AQ-MM#4) for these pollutants would reduce impacts to less than significant after mitigation.

The Authority finds that Mitigation Measures AQ-MM#1, AQ-MM#2, and AQ-MM#4 have been required in the project and that implementation of these mitigation measures will reduce the project's construction VOC, NO_x, PM₁₀, and PM_{2.5} impacts to less-than-significant levels.

3.2.2 AQ Impact #2 - Compliance with Air Quality Plans

Emissions from project construction would be temporary, occurring for 9 years, from April 2014 through June 2023. Based on the amount of construction to be completed, construction activities would involve heavy-duty construction equipment and have the potential to cause adverse air quality impacts.

VOC, NO_x, PM₁₀, and PM_{2.5} emissions would be greater than applicable significance thresholds, which would impede implementation of the 8-hour SJVAPCD 2007 Ozone Plan, the 2004 Extreme Ozone 1-hour Attainment Demonstration Plan,⁷ the 2007 PM₁₀ Maintenance Plan, and 2008 PM_{2.5} Plan. Therefore, this impact would be significant for VOC, NO_x, PM₁₀, and PM_{2.5} emissions.

AQ-MM#1: Reduce Criteria Exhaust Emissions from Construction Equipment. Details regarding AQ-MM#1 are described above.

AQ-MM#2: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment. Details regarding AQ-MM#2 are described above.

AQ-MM#4: Offset Project Construction Emissions through an SJVAPCD VERA. Details regarding AQ-MM#4 are described above.

Implementation of these mitigation measures is not expected to result in secondary impacts.

With onsite mitigation (i.e., AQ-MM#1 and #2), VOC, NO_x, PM₁₀, and PM_{2.5} impacts would be reduced, but could remain significant. As stated in SJVAPCD 2012 Draft GAMAQI (SJVAPCD 2012, pp. 67-68) and consistent with strategies outlined for incentive based programs in the most recent PM_{2.5} and ozone plans (SJVAPCD 2007, 2012), purchase of offset emissions through a VERA with the SJVAPCD (mitigation measure AQ-MM#4) for these pollutants would reduce impacts to less than significant after mitigation.

⁷ The 1-hour ozone standard was revoked by the U.S. EPA effective June 15, 2005, for areas including the SJVAB. However, the U.S. EPA still approved the 2004 Extreme Ozone Attainment Plan for 1-hour ozone on March 8, 2010 (SJVAPCD 2010).

The Authority finds that Mitigation Measures AQ-MM #1, AQ-MM #2, and AQ-MM #4 have been required in the project and that implementation of these mitigation measures will reduce the project's construction VOC, NO_x, PM₁₀, and PM_{2.5} impacts to less-than-significant levels.

3.2.3 AQ Impact #3 - Regional Impacts – Material-Hauling Emissions Outside of San Joaquin Valley Air Basin (SJVAB)

Construction emissions included in the regional impacts analysis (Impact AQ #1 and 2) considered hauling emissions within the SJVAB. High-speed rail track bed would be constructed using ballast, sub-ballast, and concrete slabs. Sub-ballast and concrete slab would be available within the SJVAB; however, the ballast could potentially be transported from areas outside the SJVAB. An emissions evaluation was conducted for transporting ballast materials from outside the SJVAB to the border of the air basin. Five hauling scenarios from five quarries were analyzed: (1) all ballast transported by rail from Kaiser Eagle Mountain Quarry; (2) ballast transported by truck and rail from Napa Quarry, Lake Herman Quarry and San Rafael Quarry; (3) ballast transported by truck and rail from a mixture of the five quarries; (4) ballast transported by truck from Napa Quarry, Lake Herman Quarry, San Rafael Quarry, and Bangor Rock Quarry Site A; and (5) ballast transported by truck from Napa Quarry, Lake Herman Quarry, San Rafael Quarry, and Kaiser Eagle Mountain Quarry. Details of the evaluations are presented in Appendix G of the *Fresno to Bakersfield Section: Air Quality Technical Report* (Authority and FRA 2014).

Emissions would exceed the thresholds for NO_x for all scenarios in multiple air quality management districts (AQMDs) or air pollution control districts (APCDs), as follows: The material-hauling emissions outside the SJVAB could exceed NO_x threshold of the SCAQMD (includes both South Coast Air Basin and Salton Sea Air Basin) in all five scenarios, and the Bay Area AQMD's NO_x thresholds for two of the scenarios. The material hauling emissions could also exceed the Mojave Desert AQMD NO_x thresholds for two of the scenarios. Exceeding or contributing to an exceedance of the NO_x air quality standards applicable in those air basins, or contributing substantially to an existing or projected NO_x air quality violation in those other air basins would be considered a significant impact.

AQ-MM#2: Reduce Criteria Exhaust Emissions from On-Road Construction Equipment. Details regarding AQ-MM#2 are described above.

AQ-MM#5: Purchase Offsets and Offsite Emission Mitigation for Emissions Associated with Hauling Ballast Material in Certain Air Districts.

This mitigation measure will apply if ballast material is hauled from quarries outside the SJVAB and the hauling activities result in the exceedance of the annual applicable General Conformity threshold(s) or local air basin CEQA threshold(s) for NO_x. To determine whether an exceedance will occur based on actual hauling activities, the Authority shall at the beginning of each calendar year or as soon as practicable thereafter to obtain the most up-to-date information, based on actual or projected contractor-specific information about hauling in the Mojave AQMD, South Coast AQMD and Bay Area AQMD, calculate for the next calendar year using the same methodology used in this EIR/EIS the expected NO_x emissions from hauling activities in those districts. If, based on that calculation, exceedance of the applicable NO_x threshold(s) is anticipated to occur in that next calendar year, the Authority will secure from the appropriate air district(s) or other appropriate source the production or generation of a sufficient quantity of NO_x offsets for that calendar year necessary to achieve conformity (in the case of exceedance of GC thresholds) and/or to result in net NO_x generation below the applicable CEQA threshold(s). At a minimum, sufficient mitigation/offsets will be secured so they are generated in the year of impact or as otherwise permitted by 40 C.F.R. Part 93 Section 93.163.

The Mojave Desert AQMD's emission bank has 2,061 tons of NO_x credits (Mojave Desert AQMD 2012); therefore, there should be enough NO_x credits to offset approximately 6 tons per year from this project in the Mojave Desert AQMD. The exact number of NO_x credits in the SCAQMD RECLAIM program is unknown, but 1,199 tons of NO_x credits were traded in 2011 and 235 tons of NO_x credits were traded in 2012 (SCAQMD 2012). Therefore, there should be enough available NO_x credits in the program to offset approximately 75 tons of NO_x per year from this project in the SCAQMD.

In the Bay Area AQMD, any material emissions above the district's significance threshold will be mitigated through an offsite emission mitigation program to achieve emission reduction due to material hauling in the Bay Area AQMD. Potential offsite mitigation programs include the Bay Area AQMD's Carl Moyer Memorial Air Quality Standards Attainment Program (CMP) or other air district emission reduction incentive programs. Depending on the final location selected to obtain ballast material, this would amount to a maximum of 3 tons of NO_x credits.

Implementation of these mitigation measures is not expected to result in secondary impacts. With onsite mitigation (i.e., AQ-MM#2), material hauling NO_x emission impacts would be reduced, but could remain significant. Purchase of offset NO_x emission credits through the Mojave Desert AQMD and SCAQMD as well as utilizing an offsite mitigation program in the Bay Area AQMD (i.e., AQ-MM#5) would reduce impacts to less than significant after mitigation.

The Authority finds that Mitigation Measures AQ-MM #2 and AQ-MM #5 have been required in the project and that implementation of these mitigation measures will reduce the project's potential regional air quality impact related to material hauling outside the SJVAB to less-than-significant levels.

3.2.4 AQ Impact #8 - Localized Air Quality Impacts from Concrete Batch Plants

The emissions generated from operation of concrete batch plants, as related to regional emissions impacts, were included in the calculations for Impacts #1 and 2.

Batch plant operation also could have localized/micro impacts. The concrete batch plants would be located along the alignment. According to Cal/EPA and CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (Cal/EPA and CARB 2005), emission impacts at receptors would be greatly reduced by locating a facility 1,000 feet from sensitive receptors. The air dispersion modeling and health risk analysis for fugitive dust emissions and their associated TAC constituents indicated that excess cancer risks and non-cancer health impacts would not exceed the applicable thresholds, but emissions may contribute to further exacerbation of exceedances of PM₁₀ and PM_{2.5} standards for micro-scale (i.e., localized) dust impacts to health. After mitigation, emissions would not substantially contribute to further exceedances of PM₁₀ and PM_{2.5} standards (see AQ-MM#3) because modeling shows that a receptor outside of 1,000 feet from the batch plant would not be exposed to concentration levels that exceed these micro-scale thresholds.

AQ-MM#3: Reduce the Potential Impact of Concrete Batch Plants. Concrete batch plants will be sited at least 1,000 feet from sensitive receptors, including daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. The concrete batch plant will utilize typical control measures to reduce the fugitive dust, such as water sprays, enclosures, hoods, curtains, shrouds, moveable and telescoping chutes, central dust collection systems and other suitable technology, to reduce emission to be equivalent to the U.S. EPA AP-42 controlled emission factors for concrete.

The control measures utilized at the batch plant may increase water usage and energy consumption, and may generate additional waste from consumables used by the control device. These impacts would be minor, however, and would be less than significant.

The Authority finds that Mitigation Measure AQ-MM#3 has been required in the project and that implementation of this mitigation measure will reduce the project's air quality impacts associated with the exposure of sensitive receptors to temporary substantial pollutant concentrations from the concrete batch plants required for project construction to less-than-significant levels.

3.3 Noise and Vibration (Section 3.4 in the Final EIR/EIS)

The Final EIR/EIS estimated the screening distances for construction noise impact using the Federal Transit Administration (FTA) construction impact noise methodology and criteria (See Table 3.4-1 in the Final EIR/EIS), and estimates of typical equipment noise for rail construction (See Table 3.4-12 in the Final EIR/EIS). The analysis assumed that construction noise reduces by 6 dB for each doubling of distance from the center of the site. These estimates suggest that the potential for construction noise impact would be minimal for commercial and industrial land use, with impact screening distances of 79 feet and 45 feet, respectively. For residential land use, the potential for temporary construction noise impact would be limited to locations within approximately 141 feet of the alignment. However, the potential for noise impact from nighttime construction could extend to residences as far as 446 feet.

The exposure of persons or generation of noise levels in excess of standards for a severe impact established by the FTA is considered a significant impact. The standards cover temporary/periodic increases in ambient noise levels above levels existing. For residences within 141 feet of the alignment during the day, or within 446 feet during nighttime, construction impacts would be a significant impact.

N&V-MM#1: Construction noise mitigation measures. During construction the contractor will monitor construction noise to verify compliance with the noise limits as shown in Table 3.4-1 of the Final EIR/EIS. The contractor would be given the flexibility to meet the FTA construction noise limits in the most efficient and cost-effective manner. This can be done by either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. A noise monitoring program will be developed to meet required noise limits, the following noise control mitigation measures will be implemented as necessary, for nighttime and daytime:

- Install a temporary construction site sound barrier near a noise source.
- Avoid nighttime construction in residential neighborhoods.
- Locate stationary construction equipment as far as possible from noise-sensitive sites.
- Re-route construction truck traffic along roadways that will cause the least disturbance to residents.
- During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters.
- Use low-noise emission equipment.
- Implement noise-deadening measures for truck loading and operations.
- Monitor and maintain equipment to meet noise limits.

- Line or cover storage bins, conveyors, and chutes with sound-deadening material.
- Use acoustic enclosures, shields, or shrouds for equipment and facilities.
- Use high-grade engine exhaust silencers and engine-casing sound insulation.
- Prohibit aboveground jackhammering and impact pile driving during nighttime hours.
- Minimize the use of generators to power equipment.
- Limit use of public address systems.
- Grade surface irregularities on construction sites.
- Use moveable sound barriers at the source of the construction activity.
- Limit or avoid certain noisy activities during nighttime hours.
- To mitigate noise related to pile driving, the use of an auger to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur.
- CHSRA will establish and maintain in operation until completion of construction a toll-free "hotline" regarding the Section construction activities. CHSRA shall arrange for all incoming messages to be logged (with summaries of the contents of each message) and for a designated representative of CHSRA to respond to hotline messages within 24 hours (excluding weekends and holidays). CHSRA shall make a reasonable good faith effort to address all concerns and answer all questions, and shall include on the log its responses to all callers. CHSRA shall make a log of the in-coming messages and CHSRA's responsive actions publicly available on its website.

Secondary impacts from construction noise mitigation measures including impacts on existing visual quality and construction light and glare are discussed in Section 3.16 Aesthetics and Visual Resources of the Final EIR/EIS. None of the other mitigation measures would result in secondary impacts.

Noise impacts would occur during construction activities and would cease after construction is complete. The Authority finds that Mitigation Measure N&V-MM#1 has been required in the project and that implementation of this mitigation measure will reduce construction noise below the FTA construction noise limits; this impact would be reduced to a less-than-significant impact.

3.3.1 N&V IMPACT #2 - Construction Vibration During Pile Driving

The exposure of persons or generation of excessive ground-borne vibration or ground-borne noise levels above the levels in Table 3.4-2 of the Final EIR/EIS is considered a significant impact. There is a potential for severe vibration impacts with receivers present within vibration criterion-level contours (See Table 3.4-13 of the Final EIR/EIS) during construction associated with pile driving and therefore construction vibration impacts would be a significant impact.

N&V-MM#2: Construction vibration mitigation measures. Building damage from construction vibration is only anticipated from impact pile driving at very close distances to buildings. If piling is more than 25 to 50 feet from buildings, or if alternative methods such as push piling or augur piling can be used, damage from construction vibration is not expected to occur. Other sources of construction vibration do not generate high enough vibration levels for damage to occur. When a construction scenario has been established, preconstruction surveys would be conducted by the contractor at locations within 50 feet of piling to document the

existing condition of buildings in case damage is reported during or after construction. The Authority would arrange for the repair of damaged buildings or compensation would be paid by the Authority to the property owner.

Implementation of this mitigation measure is not expected to result in secondary impacts. Although vibration impacts would occur during construction activities, the construction activities are considered temporary as they would cease after completion.

The Authority finds that Mitigation Measure N&V-MM#2 has been required in the project and that implementation of this mitigation measure would reduce the project's construction vibration impacts to less-than-significant levels.

3.3.2 N&V IMPACT #3 - Noise Impacts from Project Operation to Sensitive Receptors

The Final EIR/EIS assessed noise impacts from operation of the HST on noise-sensitive land uses by comparing existing, measured noise levels with future noise levels predicted for the project. The future noise levels with HST were developed following the FRA Guidance manual, as described in Section 3.4 of the Final Project EIR/EIS and as further documented in the *Fresno to Bakersfield Section: Noise and Vibration Technical Report* (Authority and FRA 2014).

The exposure of persons or generation of noise levels in excess of standards for a severe impact established by the FRA for high-speed ground transportation and the FTA for transit projects (See Figure 3.4-3 of the Final EIR/EIS) is considered a significant impact. These standards cover both permanent and temporary/periodic increases in ambient noise levels in the project vicinity above levels existing without the project. In locations with sensitive receptors where train speeds and operations are high, severe noise impacts would be a significant impact. As shown in Table 3-4-14, Table 3.4-20, and Table 3.4-21 of the Final EIR/EIS, the Preferred Alternative north of 7th Standard Road would result in significant impacts from operations at approximately 1,583 noise sensitive receptors, prior to mitigation. This is a significant impact.

N&V-MM#3: Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines. To determine the appropriate mitigation measure for properties experiencing severe noise impacts, noise mitigation guidelines would be applied as follows. Consistent with the Noise Mitigation Guidelines included as Attachment B to these Findings:

- Prior to operation of the HST, the Authority will install sound barriers where they can achieve between 5 and 15 dB of noise reduction, depending on their height and location relative to the track. The primary requirements for an effective sound barrier are that the barrier must (1) be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) be of an impervious material with a minimum surface density of 4 pounds per square foot, and (3) not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers (examples are shown in Figure 3.4-14 of the Final EIR/EIS). Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barriers style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent lands uses. For example, sound barriers could be solid or transparent, and made of various colors, materials, and surface treatments.
- The minimum number of affected sites should be at least 10, and the length of a sound barrier should be at least 800 feet. The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers would be designed to be as low as possible to achieve a substantial noise reduction. Berm and berm/wall combinations are the preferred

- types of sound barriers where space and other environmental constraints permit. On aerial structures, the maximum sound barrier height would also be 14 feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. Sound barriers on the aerial structure will still be designed to be as low as possible to achieve a substantial noise reduction. Sound barriers on both aerial structures and at-grade structures could consist of solid, semitransparent, or transparent materials.
- The Authority will work with the communities to identify how the use and height of sound barriers would be determined using jointly developed performance criteria. Other solutions may result in higher numbers of residual impacts than reported herein. Options may be to reduce the height of sound barriers and combine barriers with sound insulation or to accept higher noise thresholds than the FRA's current noise thresholds.

If sound barriers are not proposed or do not reduce sound levels to below a severe impact level, building sound insulation can be installed. Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction is a mitigation measure that can be provided when the use of sound barriers is not feasible in providing a reasonable level (5 to 7 dB) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where sound barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dB) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened. Performance criteria would be established to balance existing noise events and ambient roadway noise conditions as factors for determining mitigation measures.

- If sound walls or sound installation is not effective, the Authority can acquire easements on properties severely affected by noise. Another option for mitigating noise impacts is for the Authority to acquire easements on residences likely to be impacted by HST operations in which the homeowners would accept the future noise conditions. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.

N&V-MM#4: Vehicle noise specification. In the procurement of an HST vehicle technology, the Authority will require bidders to meet the federal regulations (40 CFR Part 201.12/13) at the time of procurement for locomotives (currently a 90-dB-level standard), for cars operating at speeds of greater than 45 mph). Depending on the available technology, this could significantly reduce the number of impacts throughout the corridor.

N&V-MM#5: Special trackwork at crossovers and turnouts. Because the impacts of HST wheels over rail gaps at turnouts increases HST noise by approximately 6 dB over typical operations, turnouts can be a major source of noise impact. If the turnouts cannot be moved from sensitive areas, the project can use special types of trackwork that eliminate the gap.

N&V-MM# 6: Additional noise analysis following final design. If final design or final vehicle specifications result in changes to the assumptions underlying the noise analysis, reassess noise impacts and recommendations for mitigation, and provide supplemental environmental documentation, as required by law.

Secondary impacts from sound walls including visual intrusion and view blockage are discussed in Section 3.16 Aesthetics and Visual Resources of the Final EIR/EIS. None of the other mitigation measures would result in secondary impacts.

Not all impacted receivers may receive noise mitigation that would reduce their impacts below the levels shown in Figure 3.4-3 of the Final EIR/EIS. Further there is uncertainty about the

effectiveness of mitigation measures because of the important role that local jurisdictions and communities will play in determining the use of sound barriers. Therefore operational noise impacts from the HST are significant and unavoidable.

The Authority finds that Mitigation Measures N&V-MM#2, N&V-MM#3, N&V-MM#4, N&V-MM#5, and N&V-MM#6 have been required in the project and that they will mitigate or avoid some, but not all, of the project's significant noise impacts to sensitive noise receptors. The Authority finds that there are no other feasible mitigation measures or alternatives that could be adopted to reduce these remaining impacts to less-than-significant levels. The Authority finds that despite these otherwise significant and unavoidable impacts, specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.3.3 N&V IMPACT #6 –Traffic Noise

Thirteen major roadway segments in the area around the Kings/Tulare Regional Station – East were analyzed. An increase in traffic volume is expected on SR 43 between Grangeville Boulevard and SR 198. The increases in traffic volume would result in an increase in the future peak-hour noise level of 1 dBA Leq. This would result in five homes that face SR 43 being exposed to a peak-hour noise level in excess of 66 dBA Leq. This noise effect could be a significant impact.

N&V-MM#3: Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines. Details regarding N&V-MM#3 are described above.

N&V-MM# 6: Additional noise analysis following final design. Details regarding N&V-MM#6 are described above.

The Authority finds that Mitigation Measures N&V-MM#3 and N&V-MM#6 have been required in the project and that implementation of these mitigation measures will reduce traffic noise impacts associated with the Kings/Tulare Regional Station – East to less-than-significant levels.

3.4 Public Utilities and Energy (Section 3.6 in the Final EIR/EIS)

3.4.1 Project Design Features

With implementation of Mitigation Measure PU&E-MM#1, the Preferred Alternative north of 7th Standard Road would not result in a significant and unavoidable impact to public utilities or energy. This conclusion is supported, in part, by the Project Design Features that the Authority has incorporated into the Project, consistent with and in furtherance of the Statewide Program EIR/EIS commitments. (See Attachment A; see also Final EIR/EIS, Section 3.6.6.) The project design incorporates precautions to avoid existing utilities and design elements that minimize electricity consumption (e.g., using regenerative braking, and energy-saving equipment and facilities). Refer to Final EIR/EIS Section 3.8, Hydrology and Water Resources, for project design features for stormwater management and treatment. The Authority has also adopted a sustainability policy that includes the project design and construction requirements that avoid and minimize impacts. In adopting the resolution of approval of the project, the Authority confirms that the Project Design Features that are set forth in Attachment A are part of the project.

3.4.2 Impact PU&E # 5 –Conflicts with Existing Utilities

The construction for the Preferred Alternative north of 7th Standard Road footprint would not overlap with or displace Southern California Edison's Mascot electrical substation, which is located at the southwest corner of Grangeville Boulevard and 7½ Standard Avenue, east of the city of

Hanford. Adjacent lines leading into the substation are within the HST construction footprint, however, and may result in an indirect conflict with the substation. Without taking the appropriate measures to reduce this conflict, there is a potential for a significant impact.

PU&E-MM#1: Reconfigure or relocate substations and/or ancillary components. The Authority will relocate the adjacent electrical lines and related ancillary components of the existing Mascot substation prior to operation. The reconfiguration will be performed in coordination and cooperation with the utility owner, Southern California Edison, so that the relocation would not result in prolonged disruption of services.

Potential impacts of mitigation, which would consist of reconfiguring potentially affected electrical lines and related components connected to an electrical substation, include brief power service interruptions when disconnecting from existing infrastructure and connecting to replacement electrical service infrastructure. Because the Authority would coordinate with the affected utility company to avoid service interruptions, for the local context, the impact of the mitigation measure would not be significant.

The Authority finds that mitigation measure PU&E MM#1 has been required in the project and that implementation of this mitigation measure will reduce the project's indirect impact to the existing Mascot substation to less-than-significant levels.

3.5 Biological Resources and Wetlands (Section 3.7 of the Final EIR/EIS)

These findings address impacts associated with the portion of the Preferred Alternative being approved in conjunction with the findings, as discussed above in Section 2. For most impact areas (BIO Impact # 1, BIO Impact # 2, BIO Impact # 5, BIO Impact # 6, and BIO Impact # 8), the same special-status species and their associated habitats, and in the case of BIO Impact # 8 the same wildlife movement corridors, will be impacted as described for the entire Preferred Alternative as analyzed in the Final EIR/EIS and the mitigation measures are therefore the same for the portion of the Preferred Alternative as they would be for the entire Preferred Alternative. For BIO Impact # 3 and BIO Impact # 7, which address construction period and project period impacts on habitats of concern, including those in conservation areas, the findings acknowledge that the Bakersfield Hybrid Alternative portion of the Preferred Alternative would have specific impacts on the Metropolitan Bakersfield Habitat Conservation Plan (HCP), and the mitigation measures for these impacts are the same as those for other habitats of concern (e.g., special-status plant communities, jurisdictional waters, recovery area), but would apply in the Bakersfield area only upon a project approval in that area.

Chapter 3.7 of the Final EIR/EIS describes impacts as either construction period, which examines temporary impacts, or project period, which examines permanent impacts (Final EIR/EIS, p. 3.7-17). This categorization is carried through in these findings.

3.5.1 BIO IMPACT #1 – Construction Impacts on Special-Status Plant Species

Up to thirty-eight special-status plant species have the potential to occur in and immediately adjacent to the footprint of the Preferred Alternative and as a result may be directly or indirectly impacted by construction period activities. As indicated in Attachment D (highlighted version of Final EIR/EIS Appendix 3.7-A) to these Findings, the potential for occurrence is identified as no potential, low, moderate, or high, based on the presence of suitable habitat, the range of the species, and the proximity of known occurrences of the species.

In addition to the species that have been observed within the Special-Status Plant Study Area, special-status plant species have the potential to occur in areas of suitable habitat in parcels that have not been surveyed. These species include federally and/or state-listed species and species listed by the California Native Plant Society, all of which are considered rare in California (CEQA Guidelines, § 15380). If these species occur in the construction footprint, they would be subject to the same adverse effects as those described below for species known to occur.

Direct (BIO #1) Impacts during Construction Period

Direct impacts on special-status plant species and native plant species may occur as a result of construction crews removing vegetation within temporary impact areas, and from construction vehicles and personnel disturbing vegetation (i.e., trampling, covering, and crushing individual plants, populations, or suitable potential habitat for special-status plant species).

Indirect (BIO #1) Impacts during Construction Period

Indirect impacts on special-status plant species and native plant species would potentially include erosion, siltation, and runoff into natural and constructed watercourses; soil and water contamination from construction equipment leaks; construction dust affecting plants by reducing their photosynthetic capability (especially during flowering periods); and an increased risk of fire (e.g., construction equipment use and smoking by construction workers) in adjacent open spaces.

The direct and indirect impacts on special-status plant species and habitats suitable for special-status plant species during construction are considered a significant impact.

Implementation of the following mitigation measures will reduce BIO Impact #1 to less than significant (due to length, the text of the biological resources mitigation measures are presented separately in Attachment F to these CEQA Findings).

BIO-MM#1. Designate Project Biologist(s), Regulatory Specialist (Waters), Project Botanist, and Project Biological Monitor(s).

BIO-MM#2. Regulatory Agency Access.

BIO-MM#3. Prepare and Implement a Worker Environmental Awareness Program.

BIO-MM#4. Prepare and Implement a Weed Control Plan and Annual Vegetation Management Plan.

BIO-MM#5. Prepare and Implement a Biological Resources Management Plan.

BIO-MM#6. Prepare and Implement a Restoration and Revegetation Plan.

BIO-MM#7. Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field).

BIO-MM#9. Equipment Staging Areas.

BIO-MM#11. Vehicle Traffic.

BIO-MM#13. Work Stoppage.

BIO-MM#14. "Take" Notification and Reporting.

BIO-MM#15. Post-Construction Compliance Reports.

BIO-MM#16. Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities.

BIO-MM#17. Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species.

BIO-MM#53. Compensate for Impacts on Special-Status Plant Species.

The Authority will avoid and minimize impacts to special-status plant species from construction activities where feasible. General avoidance/minimization measures will be implemented in order to track mitigation success and provide assurance that measures are implemented correctly and fully. These mitigation measures are standard procedures, commonly used on large infrastructure projects to reduce impacts on special-status plant species (BIO-MM#1. Designate Project Biologist(s), Regulatory Specialist (Waters), Project Botanist and Project Biological Monitor(s); BIO-MM#3. Prepare and Implement a Worker Environmental Awareness Program).

The measure BIO-MM#4 (Prepare and Implement a Weed Control Plan and Annual Vegetation Management Plan) will minimize or avoid the spread of noxious and invasive weeds during construction, and BIO-MM#6 (Prepare and Implement a Restoration and Revegetation Plan) will restore temporarily disturbed uplands following construction activities.

During final design, the Mitigation Manager, or its designee (Project Biologist, Regulatory Specialist (Waters), Project Botanist) will prepare and implement BIO-MM#5 (Prepare and Implement a Biological Resources Management Plan) which will help the long-term perpetuation of biological resources within the temporarily disturbed areas, as well as protect adjacent targeted habitats. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist will also delineate Environmentally Sensitive Areas (ESAs) and Environmentally Restricted Areas (ERAs) (BIO-MM#7) prior to the start of ground-disturbing activities, including special-status plant populations to protect these areas from impacts during construction. Additional avoidance measures to be implemented prior to construction avoid impacts to special-status plant species (see BIO-MM#9 Equipment Staging Areas and BIO-MM#11 Vehicle Traffic). Agency personnel may visit the site to ensure compliance with avoidance/minimization measures (BIO-MM#2 Regulatory Agency Access). In the event of an accidental removal or injury to a federal or state-listed plant species, the Contractor's employees will be required to notify U.S. Fish and Wildlife Service (USFWS) and/or California Department of Fish and Wildlife (CDFW) and identify any corrective measures to aid in preventing future impacts (BIO-MM#14 "Take" Notification and Reporting). Post-construction compliance reports consistent with agency protocols to document compliance with these measures will be submitted at regular intervals (BIO-MM#15 Post-Construction Compliance Reports).

To avoid and minimize impacts on special-status plant species in areas of suitable habitat where floristic surveys could not be conducted, BIO-MM#16 (Conduct Protocol-Level Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities) would identify the locations of all special-status plant species in areas not previously surveyed. Based on the results, BIO-MM#17 (Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species) can be fully implemented throughout the project area to further avoid or minimize direct and indirect impacts to special-status plants.

Since avoidance, minimization (BIO-MM#16), rectification, or reduction (BIO-MM#17) of direct and indirect impacts will not alone reduce the significance of these impacts, mitigation will also be secured by the Authority through compensatory mitigation BIO-MM#53 (Compensate for Impacts on Special-Status Plant Species). In conjunction with final design and the permitting process, in compliance with the project's Biological Opinion, the Authority will mitigate at a 1:1 ratio at a USFWS-approved site.

By avoiding, minimizing, rectifying and compensating for direct and indirect impacts to special-status plants, long-term effects to the future success of special-status plant species will be reduced.

There would be no secondary impacts from these mitigation measures. By avoiding, minimizing and compensating for direct and indirect impacts to special-status plants, long-term effects to the future success of special-status plants species will be reduced. The Authority finds that the above listed mitigation measures have been required in the project and that implementation of these measures will substantially lessen the direct and indirect impacts to special-status plant species and their habits by reducing the impact to a less-than-significant level under CEQA.

3.5.2 BIO IMPACT #2 – Construction Impacts on Special-Status Wildlife Species

Wildlife habitat and land cover types in the footprint of the Preferred Alternative have the potential to support a variety of special-status wildlife species. Construction activities have the potential to disturb the life cycles of these special-status species. Up to fifty-four special-status wildlife species have the potential to occur in and near the footprint of the Preferred Alternative and as a result may be directly or indirectly impacted by construction period activities. As indicated in Attachment D to these Findings (highlighted version of Final EIR/EIS Appendix 3.7-A, Att. 2), the potential for occurrence is identified as no potential, low, moderate, or high. The presence of and potential for special-status wildlife species to occur in a particular habitat is linked to the physical characteristics of the landscape and the species' known geographic range.

Direct (BIO #2) Impacts during Construction Period

Direct impacts associated with the Preferred Alternative on special-status wildlife species (including invertebrates, amphibians, reptiles, fish, birds, and mammals) and native fauna will disturb suitable habitats (e.g., damage or removal of host plants, disturbance to confining hardpans, destruction, alteration, degradation, fill, or pollution of suitable habitat) that have potential to support special-status wildlife species. As a result of construction activities, the Preferred Alternative may result in adverse effects on special-status wildlife species through harassment, disturbance, injury, nest abandonment or death of individuals. These impacts may occur to all life stages (i.e., eggs, larvae, young, juveniles or adults).

Direct impact may occur as a result of direct removal of host plants, permanent conversion of occupied habitat to project infrastructure, direct strike during operation and maintenance, trampling or crushing.

Indirect (BIO #2) Impacts during Construction Period

Construction period indirect impacts associated with the Preferred Alternative on special-status wildlife species (including invertebrates, amphibians, reptiles, fish, birds, and mammals,) and native fauna may result from increased noise, light, and ground disturbance. These impacts may indirectly result in water quality degradation, hydrological modifications, habitat degradation (through soil compaction, or alteration of vegetation cover), introduce nonnative invasive (noxious) weeds, reduce in host plant vigor, and in some cases may result in mortality of individuals.

Specifically, the indirect impacts may result in reduced reproductive success, decreased survivorship of these species and their food, abandonment of refugia (e.g., burrows), temporary shifts in foraging patterns or territories (displacement), and increased mortality or predation. These impacts may occur to all life stages (i.e., eggs, larvae, young, juveniles or adults).

The direct and indirect impacts on special-status wildlife species and their suitable habitats during construction are considered a significant impact under CEQA.

Implementation of the following mitigation measures will reduce BIO Impact #2 to less than significant (due to length, the text of the biological resources mitigation measures are presented separately in Attachment F to these CEQA Findings).

BIO-MM#1. Designate Project Biologist(s), Regulatory Specialist (Waters), Project Botanist and Project Biological Monitor(s).

BIO-MM#2. Regulatory Agency Access.

BIO-MM#3. Prepare and Implement a Worker Environmental Awareness Program.

BIO-MM#5. Prepare and Implement a Biological Resources Management Plan.

BIO-MM#6. Prepare and Implement a Restoration and Revegetation Plan.

BIO-MM#7. Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field).

BIO-MM#8. Wildlife Exclusion Fencing.

BIO-MM#9. Equipment Staging Areas.

BIO-MM#10. Mono-Filament Netting.

BIO-MM#11. Vehicle Traffic.

BIO-MM#12. Entrapment Prevention.

BIO-MM#13. Work Stoppage.

BIO-MM#14. "Take" Notification and Reporting.

BIO-MM#15. Post-Construction Compliance Reports.

AVR-MM#1b. Minimize Light Disturbance during Construction.

BIO-MM#18. Conduct Preconstruction Sampling and Assessment for Vernal Pool Fauna.

BIO-MM#19. Seasonal Vernal Pool Work Restriction.

BIO-MM#20. Implement and Monitor Vernal Pool Protection.

BIO-MM#21. Implement Conservation Guidelines for the Valley Elderberry Longhorn Beetle.

BIO-MM#22. Conduct Preconstruction Surveys for Special-Status Reptile and Amphibian Species.

BIO-MM#23. Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation.

BIO-MM#24. Conduct Protocol and Preconstruction Surveys for California Tiger Salamander.

BIO-MM#25. Implement Avoidance and Minimization Measures for California Tiger Salamander.

- BIO-MM#26.** Conduct Protocol-Level Surveys for Blunt-Nosed Leopard Lizard.
- BIO-MM#27.** Phased Preconstruction Surveys for Blunt-Nosed Leopard Lizard.
- BIO-MM#28.** Blunt-Nosed Leopard Lizard Avoidance.
- BIO-MM#29.** Conduct Preconstruction Surveys and Delineate Active Nest Exclusion Areas for Other Breeding Birds.
- BIO-MM#30.** Conduct Preconstruction Surveys and Monitoring for Raptors.
- BIO-MM#31.** Bird Protection.
- BIO-MM#32.** Conduct Preconstruction Surveys for Swainson's Hawks.
- BIO-MM#33.** Swainson's Hawk Nest Avoidance and Monitoring.
- BIO-MM#34.** Monitor Removal of Nest Trees for Swainson's Hawks.
- BIO-MM#35.** Conduct Protocol Surveys for Burrowing Owls.
- BIO-MM#36.** Burrowing Owl Avoidance and Minimization.
- BIO-MM#37.** Conduct Preconstruction Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse.
- BIO-MM#38.** Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse.
- BIO-MM#39.** Implement Avoidance and Minimization Measures for Fresno Kangaroo Rat.
- BIO-MM#40.** Conduct Preconstruction Surveys for Special-Status Bat Species.
- BIO-MM#41.** Bat Avoidance and Relocation.
- BIO-MM#42.** Bat Exclusion and Deterrence.
- BIO-MM#43.** Conduct Preconstruction Surveys for American Badger and Ringtail.
- BIO-MM#44.** American Badger and Ringtail Avoidance.
- BIO-MM#45.** Conduct Preconstruction Surveys for San Joaquin Kit Fox.
- BIO-MM#46.** Minimize Impacts on San Joaquin Kit Fox.
- BIO-MM#49.** Monitor Construction Activities within Jurisdictional Waters.
- BIO-MM#54.** Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp.
- BIO-MM#55.** Implement Conservation Guidelines during project operation for Valley Elderberry Longhorn Beetle.
- BIO-MM#56.** Compensate for Impacts on California Tiger Salamander.
- BIO-MM#57.** Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel.

BIO-MM#58. Compensate for Loss of Swainson's Hawk Nesting Trees.

BIO-MM#59. Compensate for Loss of Burrowing Owl Active Burrows and Habitat.

BIO-MM#60. Compensate for Destruction of San Joaquin Kit Fox Habitat.

BIO-MM#65. Offsite Habitat Restoration, Enhancement and Preservation.

Impacts to special-status wildlife species from construction activities will be avoided and minimized where feasible. The following general avoidance/minimization measures will be implemented in order to track mitigation success and provide assurance that measures are implemented correctly and fully. These mitigation measures are standard procedures, commonly used on large infrastructure projects. Many of the mitigation measures described in BIO Impact #1 have the same or similar ability to reduce impacts to special-status wildlife species.

As such, they are not repeated here except for those measures that are unique to BIO Impact #2.

To minimize entanglement of special-status wildlife species, the erosion control materials will not include plastic mono-filament netting (BIO-MM#10 Mono-Filament Netting). Wildlife exclusion barriers will keep wildlife out of the construction work area as specified and designed through consultation with USFWS and/or CDFW (BIO-MM#8 Wildlife Exclusion Fencing). In areas that have the potential to entrap wildlife, entrapment prevention measures will be enacted (BIO-MM#12 Entrapment Prevention). These measures may include covering holes, providing escape ramps or covering culverts.

To further avoid impacts to special-status wildlife species, work will stop in the event a special-status wildlife species enters the construction footprint in an area where construction is occurring (BIO-MM#13 Work Stoppage). Work will be suspended until the individual leaves voluntarily or is relocated using USFWS- and/or CDFW-approved techniques or methods.

To minimize impacts from light during nighttime construction, lighting will be directed so that the light source is not visible off-site, and so that the light does not fall outside the boundaries of the project site to avoid light spillage off-site (AVR-MM#1b Minimize Light Disturbance during Construction).

Qualified, agency-approved Biologists (where required, or as designated by the Project Biologist) will conduct preconstruction, protocol-level and focused surveys for special-status wildlife where suitable habitat is present within the construction footprint. Conducting protocol level surveys will aid in the avoidance and minimization of impacts to special-status wildlife species by identifying the locations where each species occurs and/or has the potential to occur in order to guide the avoidance and minimization mitigation measures and implement performance standards:

- BIO-MM#18. Conduct Preconstruction Sampling and Assessment for Vernal Pool Fauna;
- BIO-MM#21. Implement Conservation Guidelines for the Valley Elderberry Longhorn Beetle;
- BIO-MM#22. Conduct Preconstruction Surveys for Special-Status Reptile and Amphibian Species;
- BIO-MM#24. Conduct Protocol and Preconstruction Surveys for California Tiger Salamander;
- BIO-MM#26. Conduct Protocol-Level Surveys for Blunt-Nosed Leopard Lizard;
- BIO-MM#27. Phased Preconstruction Surveys for Blunt-Nosed Leopard Lizard;

- BIO-MM#29. Conduct Preconstruction Surveys and Delineate Active Nest Exclusion Areas for Other Breeding Birds;
- BIO-MM#32. Conduct Preconstruction Surveys for Swainson's Hawks;
- BIO-MM#30. Conduct Preconstruction Surveys and Monitoring for Raptors;
- BIO-MM#35. Conduct Protocol Surveys for Burrowing Owls;
- BIO-MM#37. Conduct Preconstruction Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse
- BIO-MM#40. Conduct Preconstruction Surveys for Special-Status Bat Species
- BIO-MM#43. Conduct Preconstruction Surveys for American Badger and Ringtail;
- BIO-MM#45. Conduct Preconstruction Surveys for San Joaquin Kit Fox.

The result of the surveys will identify areas where additional mitigation measures are required in order to avoid and minimize impacts on special-status wildlife species. The surveys will provide additional information that will be used to guide the placement of ESAs, ERAs, and wildlife exclusion fencing, the extent and location of construction buffers, focus monitoring efforts, and in some instance species relocation. As a result impacts on special-status species and their habitat will be avoided and minimized. These measures include BIO-MM#19 Seasonal Vernal Pool Work Restriction; BIO-MM#20 Implement and Monitor Vernal Pool Protection; BIO-MM#21 Implement Conservation Guidelines for the Valley Elderberry Longhorn Beetle; BIO-MM#23 Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance and Relocation; BIO-MM#25. Implement Avoidance and Minimization Measures for California Tiger Salamander; BIO-MM#28 Blunt-Nosed Leopard Lizard Avoidance; BIO-MM#33 Swainson's Hawk Nest Avoidance and Monitoring); BIO-MM#34 Monitor Removal of Nest Trees for Swainson's Hawk; BIO-MM#36. Burrowing Owl Avoidance and Minimization; BIO-MM#38 Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse; BIO-MM#39 Implement Avoidance and Minimization Measures for Fresno Kangaroo Rat; BIO-MM#41 Bat Avoidance and Relocation; BIO-MM#42 Bat Exclusion and Deterrence; BIO-MM#44 American Badger and Ringtail Avoidance; BIO-MM#46 Minimize Impacts on San Joaquin Kit Fox; and BIO-MM#49 Monitor Construction Activities within Jurisdictional Waters;

In many instances these avoidance and minimization measures follow existing natural resource agency guidelines or protocols. These include the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a); CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFW 2012); and USFWS' *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS [1999] 2011).

Further avoidance and minimization measures for impacts to special-status bird species include engineering design of catenary systems, masts, fencing and other structures in accordance with design standards of transmission lines, where applicable (BIO-MM#31 Bird Protection).

Where direct or indirect impacts to special-status wildlife species, cannot be sufficiently avoided, minimized or rectified, the Authority will conduct compensatory mitigation. The compensatory mitigation may include preservation, enhancement, restoration, or creation of suitable habitats that will protect in perpetuity suitable occupied habitat for impacted species at a level commensurate to or in excess of the project's direct and indirect impacts. Applicable compensatory mitigation measures include:

- BIO-MM#54 Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp;
- BIO-MM#56 Compensate for Impacts on California Tiger Salamander;
- BIO-MM#57 Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel;
- BIO-MM#58 Compensate for Loss of Swainson's Hawk Nesting Trees;
- BIO-MM#59 Compensate for Loss of Burrowing Owl Active Burrows and Habitat;
- BIO-MM#60 Compensate for Destruction of San Joaquin Kit Fox Habitat;
- BIO-MM#63 Compensate for Permanent and Temporary Impacts on Jurisdictional Waters.

In many instances the compensatory mitigation follows existing natural resource agency guidelines or protocols. These include the USFWS' *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a) and CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Examples of compensatory mitigation may include the conservation of similar vegetation communities to that of the impact area, a conservation easement, and the development and implementation of a land management plan to address the long-term sustainability of the mitigation site for special-status wildlife species. Habitat compensation may be accomplished by (1) purchasing "credits" from a USFWS-approved and/or CDFW-approved conservation bank with a service area covering the impact area; (2) acquiring appropriate properties in fee-title; or (3) establishing a conservation easement over a property. The USFWS- and CDFW- approved compensation will be consistent with the USFWS Biological Opinion and/or CDFW 2081(b).

Where offsite mitigation is necessary to offset short-term temporary and/or long-term permanent residual impacts that have not been sufficiently avoided, reduced, rectified or minimized to a less-than-significant level, the Authority will identify suitable habitat restoration, enhancement, and preservation sites to compensate for the residual impacts on special-status wildlife species (BIO-MM#65 Offsite Habitat Restoration, Enhancement, and Preservation). In order to minimize secondary impacts associated with the offsite compensatory mitigation, the offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored in ways that are consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite.

There would be no secondary impacts from these mitigation measures. By avoiding, minimizing and compensating for direct and indirect impacts to special-status wildlife, long-term effects to the future success of special-status wildlife species will be reduced. The Authority finds that the combination of the above list of mitigation measures would substantially lessen the direct and indirect impacts to special-status wildlife species by reducing them to a less than significant impact under CEQA.

3.5.3 BIO Impact #3 – Construction Effects on Habitats of Concern

As described in Section 3.7.4 of the Final EIR/EIS, habitats of concern occurring within the study area for the Preferred Alternative include special-status plant communities, jurisdictional waters, conservation areas, and protected trees. These are identified for the Preferred Alternative in Attachment E to these Findings (highlighted version of Final EIR/EIS Appendix 3.7-B, Atts. 3, 4, & 5). The avoidance of sensitive biological resources was an important consideration during the

design of the HST alternatives and the selection of the Preferred Alternative. Project design features, such as elevated sections, minimize direct effects while accommodating operation requirements.

Direct (BIO #3) Impacts during Construction Period

Construction activities within and adjacent to temporary impact areas of the construction footprint would have direct impacts on habitats of concern. These impacts would include removal or disruption (i.e., trampling and crushing) of special-status plant communities by construction vehicles and personnel. With respect to vegetation removal, it should be noted that vegetation within the HST right-of-way would be permanently removed (as discussed under BIO Impact #7). However, habitats of concern requiring removal to accommodate construction operations (i.e., access and laydown area) would be restored after construction activities are completed (BIO-MM#47, BIO-MM#48).

Direct construction impacts on jurisdictional waters include the placement of temporary fill during construction in both man-made and natural jurisdictional waters. Construction staging areas are planned adjacent to seasonal riverine features to facilitate construction of elevated structures, and are also planned where bridges are proposed at at-grade crossings. Temporary fill would be placed during the construction of access roads and staging/equipment storage areas. This fill would result in a temporary loss of jurisdictional waters; potential impacts on the physical, chemical and biological characteristics of aquatic substrates and food webs; and a potential increase in erosion and sediment transport into adjacent aquatic areas.

Direct construction impacts on satellite and linkage areas identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) would include the creation of temporary partial or total movement barriers to special-status species, the loss or degradation of special-status plant and wildlife species, and the loss or degradation of the lands that could support or provide habitat for these species.

Construction of the HST project would result in the temporary removal or modification of protected trees within the construction footprint, which could conflict with the objectives, goals, and/or provisions identified in approved local, regional, or state conservation plans.

Indirect (BIO #3) Impacts during Construction Period

Indirect impacts would include contamination of habitats of concern outside the construction footprint from construction equipment leaks; construction dust reducing photosynthetic capability; and an increased risk of fire in adjacent open spaces.

Temporary indirect construction impacts on special-status plant communities would include fragmentation and introduction of nonnative, invasive plant species. These changes would result in decreased viability and gradual loss of special-status plant communities. Fragmentation would result from the construction of temporary features, especially linear features, including access roads that bisect special-status plant communities. Construction activities could facilitate the spread of nonnative invasive plant species through introduction of seeds by construction equipment, vehicles, and personnel.

Because Project period indirect impacts on jurisdictional waters are more extensive than and tend to encompass the construction period impacts, the indirect impacts on jurisdictional waters are discussed in BIO Impact #7 in Section 3.7.5.3, High-Speed Train Alternatives (Project Impacts, Habitats of Concern).

Indirect construction impacts on satellite and linkage areas identified in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) would include fragmentation

of satellite and linkages areas where crossed by temporary construction activities (e.g., staging areas and access roads) and disturbance of natural lands within recovery areas that reduces habitat value for species recovery.

The direct and indirect impacts on habitats of concern during construction are considered a significant impact.

Implementation of the following mitigation measures will reduce BIO Impact #3 to less than significant (due to length, the text of the biological resources mitigation measures are presented separately in Attachment F to these CEQA Findings):

BIO-MM#1. Designate Project Biologist(s), Regulatory Specialist (Waters), Project Botanist and Project Biological Monitor(s).

BIO-MM#2. Regulatory Agency Access.

BIO-MM#3. Prepare and Implement a Worker Environmental Awareness Program.

BIO-MM#5. Prepare and Implement a Biological Resources Management Plan.

BIO-MM#6. Prepare and Implement a Restoration and Revegetation Plan.

BIO-MM#7. Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field).

BIO-MM#9. Equipment Staging Areas.

BIO-MM#11. Vehicle Traffic.

BIO-MM#13. Work Stoppage.

BIO-MM#15. Post-Construction Compliance Reports.

BIO-MM#16. Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities.

BIO-MM#47. Restore Temporary Riparian Impacts.

BIO-MM#48. Restore Temporary Impacts on Jurisdictional Waters.

BIO-MM#49. Monitor Construction Activities within Jurisdictional Waters.

BIO-MM#50. Mitigation and Monitoring of Protected Trees.

BIO-MM#61. Compensate for Permanent Riparian Impacts.

BIO-MM#62. Prepare and Implement a Site-Specific Comprehensive Mitigation and Monitoring Plan.

BIO-MM#63. Compensate for Permanent and Temporary Impacts on Jurisdictional Waters.

BIO-MM#64. Compensate for Impacts to Protected Trees.

BIO-MM#65. Offsite Habitat Restoration, Enhancement and Preservation.

Impacts on habitats of concern from construction activities will be avoided and minimized where feasible. General avoidance/minimization measures will be implemented in order to track

mitigation success and provide assurance that measures are implemented correctly and fully. These mitigation measures are standard procedures, commonly used on large infrastructure projects. The measures are the same as the general mitigation measure described in BIO Impact #1 and 2 and have the same or similar ability to reduce impacts on habitats of concern. As such, they are not repeated here except for those additional measures that did not apply to Bio Impact #1 and 2.

To avoid and minimize impacts on habitats of concern, in areas of suitable habitat where floristic surveys could not be conducted, BIO-MM#16 (Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities) would identify the locations of all special-status plant communities in areas not previously surveyed.

The Authority will avoid and minimize impacts on Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998) covered species through implementation of USFWS' Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS [1999] 2011) (BIO-MM#46 Minimize Impacts on San Joaquin Kit Fox).

To reduce impacts on jurisdictional waters, protective devices will be installed and construction will be monitored (BIO-MM#49 Monitor Construction Activities within Jurisdictional Waters).

Impacts to protected trees will be reduced by conducting preconstruction surveys to evaluate the condition of protected trees, fencing protected trees that may be indirectly affected by construction activities to form ERAs, or by transplanting trees (BIO-MM#50 Mitigation and Monitoring of Protected Trees).

Where avoidance and minimization of habitats is not feasible, both temporary and permanent impacts will be mitigated through habitat restoration. To reduce impacts to these sensitive habitats, during post-construction, the Contractor will revegetate all disturbed riparian areas (BIO-MM#47 Restore Temporary Riparian Impacts) and restore topography of jurisdictional waters using stockpiled and segregated soils and revegetate disturbed areas (BIO-MM#48 Restore Temporary Impacts on Jurisdictional Waters).

Since avoidance, minimization, rectification, or reduction of direct and indirect impacts will not alone fully mitigate all impacts on habitats of concern to a less than significant level, mitigation will also be secured by the Authority through compensatory mitigation. The Authority will compensate for permanent impacts on habitats of concern, as determined in consultation with the appropriate agencies (e.g., USACE, CDFW, SWRCB), through (1) purchasing "credits" from a Service-approved conservation bank with a service area covering the impact area; (2) acquiring appropriate properties in fee-title; or (3) establishing a conservation easement over a property. Specifically, the following compensatory mitigation will mitigate for loss of habitats of concern:

- BIO-MM#60 Compensate for Destruction of San Joaquin Kit Fox Habitat
- BIO-MM#61 Compensate for Permanent Riparian Impacts
- BIO-MM#63 Compensate for Permanent and Temporary Impacts on Jurisdictional Waters
- BIO-MM#64 Compensate for Impacts to Protected Trees

Compensation shall include aquatic resources restoration, establishment, enhancement, or preservation. For riparian areas, a 2:1 ratio for Valley Foothill Riparian is the proposed ratio for restoration and/or purchase of credits in a mitigation bank. For vernal pool habitat, a 2:1 ratio is the proposed minimum for compensation. For all other jurisdictional waters the Authority will mitigate impacts on aquatic resource at minimum of a 1:1 ratio, or as determined in consultation

with the appropriate agencies. For protected trees, the Authority will provide mitigation in accordance to the local regulations and laws in each jurisdiction.

Prior to the start of ground-disturbing activities, in order to ensure compliance with permit applications for USFWS, USACE, SWRCB, and CDFW, the Authority will develop a site specific Comprehensive Mitigation Monitoring Plan(s) containing performance standards (BIO-MM#62 Prepare and Implement a Site-Specific Comprehensive Mitigation and Monitoring Plan).

Offsite mitigation is necessary for short-term temporary and/or long-term permanent residual impacts that have not been sufficiently avoided, reduced, rectified or minimized to a less-than-significant level by project Design Features or other mitigation measures. The Authority will identify suitable habitat restoration, enhancement, and preservation sites to compensate for the residual impacts on habitats of concern (BIO-MM#65 Offsite Habitat Restoration, Enhancement, and Preservation). In order to minimize any potential mitigation impacts offsite, the offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite. There would be no significant secondary impacts from implementation of these mitigation measures. By avoiding, minimizing and compensating for direct and indirect impacts to habitats of concern, long-term effects to the future success of habitats of concern will be reduced. The Authority finds that the combination of the above list of mitigation measures would substantially lessen the direct and indirect impacts to habitats of concern by reducing the impacts to a less than significant level under CEQA.

3.5.4 BIO Impact #5 – Project Effects on Special-Status Plant Species

Up to thirty-eight special-status plant species have the potential to occur in and immediately adjacent to the footprint of the Preferred Alternative and as a result may be directly or indirectly impacted by project period activities. As indicated in Attachment D to these Findings (highlighted version of Final EIR/EIS Appendix 3.7A, Att. 1), the potential for occurrence is identified as no potential, low, moderate, or high, based on the presence of suitable habitat, the range of the species, and the proximity of known occurrences of the species.

In addition to the species that have been observed within the Special-Status Plant Study Area, special-status plant species have the potential to occur in areas of suitable habitat in parcels that have not been surveyed. These species include federally and/or state-listed species and species listed by the California Native Plant Society, all of which are considered rare in California. If these species occur in the construction footprint, they would be subject to the same adverse effects as those described below for species known to occur.

Direct (BIO #5) Project Impacts

Direct impacts on special-status plant species and native plant species would result from the permanent removal of vegetation from within the Preferred Alternative footprint. Disturbance of individuals, populations, or potential suitable habitat for special-status plant species could occur during construction of permanent infrastructure, and ongoing operation and maintenance activities (e.g., routine inspection and maintenance of the HST right-of-way).

Direct impacts include the permanent removal of special-status plant communities and land cover types that provide habitat for a number of special-status plants. Based on the habitat requirements of special-status plants, as many as 38 species have a potential to occur within the Preferred Alternative. Some areas within the Preferred Alternative were not made available for pedestrian field surveys. Therefore, inaccessible areas with potentially suitable habitat present

are considered occupied by special-status plant species. For these reasons, Preferred Alternative is assumed to have suitable habitat for special-status plant species.

Indirect (BIO #5) Project Impacts

Indirect impacts on special-status plant species and native plant species would potentially include erosion, siltation, and runoff into natural and constructed watercourses; soil and water contamination from construction equipment leaks; construction dust affecting plants by reducing their photosynthetic capability (especially during flowering periods); and an increased risk of fire (e.g., construction equipment use and smoking by construction workers) in adjacent open spaces.

Indirect impacts on special-status plant species and native plant species are anticipated to include erosion, sedimentation, siltation, and changes in hydrology that could affect adjacent aquatic habitats; wind erosion effects; increased risk of fire; habitat degradation through changes in habitat heterogeneity, fragmentation, and the introduction of nonnative invasive plant species; and introduction of noxious plant species.

The direct and indirect impacts on special-status plant species and habitats suitable for special-status plant species during the project period are considered a significant impact.

Implementation of the following mitigation measures will reduce BIO Impact #5 to less than significant (due to length, the text of the biological resources mitigation measures are presented separately in Attachment F to these CEQA Findings):

BIO-MM#1. Designate Project Biologist(s), Regulatory Specialist (Waters), Project Botanist and Project Biological Monitor(s).

BIO-MM#2. Regulatory Agency Access.

BIO-MM#3. Prepare and Implement a Worker Environmental Awareness Program.

BIO-MM#5. Prepare and Implement a Biological Resources Management Plan.

BIO-MM#6. Prepare and Implement a Restoration and Revegetation Plan.

BIO-MM#7. Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in-field).

BIO-MM#9. Equipment Staging Areas.

BIO-MM#11. Vehicle Traffic.

BIO-MM#13. Work Stoppage.

BIO-MM#14. "Take" Notification and Reporting.

BIO-MM#15. Post-Construction Compliance Reports.

BIO-MM#16. Conduct Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities.

BIO-MM#17. Prepare and Implement Plan for Salvage, Relocation, and/or Propagation of Special-Status Plant Species.

BIO-MM#53. Compensate for Impacts on Special-Status Plant Species.

Project impacts on special-status plant species would be similar to construction impacts; however, impacts would be permanent and would result in continued indirect impacts resulting from construction of permanent infrastructure and train operation. Impacts to special-status plant species would be reduced by the Mitigation Measures described under BIO Impact #1.

There would be no secondary impacts from these mitigation measures. By minimizing and compensating for direct and indirect impacts to special-status plants, long-term effects to the future success of special-status plant species will be reduced. The combination of these mitigation measures would lessen the direct and indirect impacts to special-status plant species to a less than significant impact under CEQA.

3.5.5 BIO Impact #6 – Project Effects on Special-Status Wildlife Species

Up to fifty-four special-status wildlife species have the potential to occur in and near the footprint of the Preferred Alternative and as a result may be directly or indirectly impacted by project period activities. As indicated in Attachment D to these Findings (highlighted version of Final EIR/EIS Appendix 3.7-A, Att. 2), the potential for occurrence is identified as no potential, low, moderate, or high. The presence of and potential for special-status wildlife species to occur in a particular habitat is linked to the physical characteristics of the landscape and the species known geographic range.

Direct (BIO #6) Project Impacts

Direct impacts to special-status wildlife species (including invertebrates, amphibians, reptiles, fish, birds, and mammals) and native fauna may occur as a result of direct removal of host plants, permanent conversion of occupied habitat to project infrastructure, direct strike during operation and maintenance, trampling or crushing, exposure to contaminants, erosion, and sedimentation, etc. These direct impacts to individual special-status wildlife species occur within the limits of disturbance. As a result of project activities, the Preferred Alternative may result in adverse effects on special-status wildlife species through harassment, disturbance, injury, nest abandonment, or death of individuals. These impacts may occur to all life stages (i.e., eggs, larvae, young, juveniles, or adults). Ongoing operation and maintenance activities would also occur (e.g., routine inspection and maintenance of the HST right-of-way) and would similarly involve disturbance from trampling or crushing of native vegetation by vehicle or foot traffic.

Indirect (BIO #6) Project Impacts

Project period indirect impacts on special-status wildlife species (including invertebrates, amphibians, reptiles, fish, birds, and mammals) and native fauna associated with the Preferred Alternative may result from increased noise, light, visual (motion) and ground disturbance. During operation, maintenance activities could contribute to chemical runoff and pollution of adjacent habitat. Project elements including security fencing and electrical infrastructure may attract predators (e.g., raptors, coyotes) and increase prey on special-status wildlife species. These impacts may indirectly result in water quality degradation and contamination, hydrological modifications, habitat degradation (through soil compaction, or alteration of vegetation cover), introduce nonnative invasive (noxious) weeds, reduce host plant vigor, and in some cases may result in mortality of individuals.

Specifically, the indirect impacts may result in reduced reproductive success, decreased survivorship of these species and their food, abandonment of refugia (e.g., burrows), temporary shifts in foraging patterns or territories (displacement), dispersal movements, changes in behavior (e.g., startle and avoidance), reduced population viability, and increased mortality or

predation. These impacts may occur to all life stages (i.e., eggs, larvae, young, juveniles or adults).

The direct and indirect impacts on special-status wildlife species and native fauna during the project period are considered a significant impact. Implementation of the following mitigation measures will reduce BIO Impact #6 to less than significant (due to length, the text of the biological resources mitigation measures are presented separately in Attachment F to these CEQA Findings):

BIO-MM#18. Conduct Preconstruction Sampling and Assessment for Vernal Pool Fauna.

BIO-MM#19. Seasonal Vernal Pool Work Restriction.

BIO-MM#20. Implement and Monitor Vernal Pool Protection.

BIO-MM#21. Implement Conservation Guidelines for the Valley Elderberry Longhorn Beetle.

BIO-MM#22. Conduct Preconstruction Surveys for Special-Status Reptile and Amphibian Species.

BIO-MM#23. Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation.

BIO-MM#24. Conduct Protocol and Preconstruction Surveys for California Tiger Salamander.

BIO-MM#25. Implement Avoidance and Minimization Measures for California Tiger Salamander.

BIO-MM#26. Conduct Protocol-Level Surveys for Blunt-Nosed Leopard Lizard.

BIO-MM#27. Phased Preconstruction Surveys for Blunt-Nosed Leopard Lizard.

BIO-MM#28. Blunt-Nosed Leopard Lizard Avoidance.

BIO-MM#29. Conduct Preconstruction Surveys and Delineate Active Nest Exclusion Areas for Other Breeding Birds.

BIO-MM#30. Conduct Preconstruction Surveys and Monitoring for Raptors.

BIO-MM#31. Bird Protection.

BIO-MM#32. Conduct Preconstruction Surveys for Swainson's Hawks.

BIO-MM#33. Swainson's Hawk Nest Avoidance and Monitoring.

BIO-MM#34. Monitor Removal of Nest Trees for Swainson's Hawks.

BIO-MM#35. Conduct Protocol Surveys for Burrowing Owls.

BIO-MM#36. Burrowing Owl Avoidance and Minimization.

BIO-MM#37. Conduct Preconstruction Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse.

BIO-MM#38. Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse.

BIO-MM#39. Implement Avoidance and Minimization Measures for Fresno Kangaroo Rat.

- BIO-MM#40.** Conduct Preconstruction Surveys for Special-Status Bat Species.
- BIO-MM#41.** Bat Avoidance and Relocation.
- BIO-MM#42.** Bat Exclusion and Deterrence.
- BIO-MM#43.** Conduct Preconstruction Surveys for American Badger and Ringtail.
- BIO-MM#44.** American Badger and Ringtail Avoidance.
- BIO-MM#45.** Conduct Preconstruction Surveys for San Joaquin Kit Fox.
- BIO-MM#46.** Minimize Impacts on San Joaquin Kit Fox.
- BIO-MM#47.** Restore Temporary Riparian Impacts.
- BIO-MM#48.** Restore Temporary Impacts on Jurisdictional Waters.
- BIO-MM#49.** Monitor Construction Activities within Jurisdictional Waters.
- BIO-MM#51.** Install Flashing or Slats within Security Fencing.
- BIO-MM#52.** Construction in Wildlife Movement Corridors.
- BIO-MM#54.** Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp.
- BIO-MM#55.** Implement Conservation Guidelines during project operation for Valley Elderberry Longhorn Beetle.
- BIO-MM#56.** Compensate for Impacts on California Tiger Salamander.
- BIO-MM#57.** Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel.
- BIO-MM#58.** Compensate for Loss of Swainson's Hawk Nesting Trees.
- BIO-MM#59.** Compensate for Loss of Burrowing Owl Active Burrows and Habitat.
- BIO-MM#60.** Compensate for Destruction of San Joaquin Kit Fox Habitat.
- BIO-MM#61.** Compensate for Permanent Riparian Impacts.
- BIO-MM#63.** Compensate for Permanent and Temporary Impacts on Jurisdictional Waters.
- BIO-MM#65.** Offsite Habitat Restoration, Enhancement and Preservation.
- N&V-MM#3.** Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines.

Project impacts on special-status wildlife species would be similar to construction impacts; however, impacts would be permanent and would result in continued indirect impacts resulting from construction of permanent infrastructure and train operation. Impacts to special-status wildlife species would be reduced by the Mitigation Measures described under BIO Impact #1 and #2 (including the compensatory mitigation).

In addition to those measures, the following mitigation measures will also be implemented to avoid and minimize impacts on special-status wildlife species.

Noise impacts to special-status wildlife species present in developed areas will be minimized by the construction of sound walls (N&V-MM#3 Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines).

Before the start of operation permanent special-status reptile and mammal-proof fencing consistent with applicable permits as determined in consultation with USFWS and CDFW will be installed (BIO-MM#51 Install Flashing or Slats in Security Fencing). The installation of flashing or slats within the security fencing will reduce impacts to wildlife species by preventing access to the HST which will reduce injury and mortality in special-status wildlife species

There would be no secondary impacts from these mitigation measures. By minimizing and compensating for direct and indirect impacts to special-status wildlife, long-term effects to the future success of special-status wildlife species will be reduced. The Authority finds that the combination of the above listed mitigation measures would substantially lessen the direct and indirect impacts to special-status wildlife species from project activities by reducing the impacts to a less than significant level under CEQA.

3.5.6 BIO Impact #7 – Project Effects on Habitats of Concern

As described in Section 3.7.4 of the Final EIR/EIS, habitats of concern occurring within the study area for the Preferred Alternative include special-status plant communities, jurisdictional waters, conservation areas, and protected trees. For purposes of the EIR/EIS, special-status plant communities include “sensitive natural communities” as defined by the California Department of Fish and Wildlife (Final EIR/EIS, p. 3.7-32). These are identified for the Preferred Alternative in Attachment E to these Findings (highlighted version of Final EIR/EIS Appendix 3.7-B, Atts. 3-6). The avoidance of sensitive biological resources was an important consideration during the design of the HST alternatives and the selection of the Preferred Alternative. Project design features, such as elevated sections, minimize direct effects while accommodating operation requirements.

Direct (BIO #7) Project Impacts

Direct impacts include the permanent conversion of habitats of concern (e.g., special-status plant communities, jurisdictional waters, conservation areas, and protected trees). Direct project impacts on habitats of concern would result from operation and maintenance and also includes the various permanent project components (e.g., embankments, rail bed, road overcrossings, and aerial structure footings).

Impacts on special-status plant communities would include the permanent removal of vegetation from within the construction footprint, and the disturbance (i.e., trampling or crushing) of plants due to an increase of pedestrian access/activity in the area. Ongoing operation and maintenance activities would also occur (e.g., routine inspection and maintenance of the HST right-of-way) and would similarly involve disturbance from trampling or crushing of native vegetation by vehicle or foot traffic.

The contouring and placement of fill in jurisdictional waters would result in the permanent loss of jurisdictional waters; irreversible impacts on the physical, chemical, and biological characteristics of aquatic substrates and food webs; and a potential increase in erosion and sediment transport into adjacent aquatic areas. Direct impacts on jurisdictional waters (i.e., natural and man-made features) would also include the removal or modification of local hydrology and the redirection of flow within jurisdictional waters. Permanent impacts on jurisdictional waters would occur during construction of bridges and viaducts over biological resources such as rivers or creeks (e.g., Kings River, Dutch John Slough, Cole Slough, Cross Creek, Tule River, Deer Creek, and Kern

River) and wetlands, as well as man-made ditches and basins (including shading, support piers, and removal of vegetation).

Many of the jurisdictional waters (canal/ditches, and seasonal riverine) are heavily managed by local irrigation districts, which serve public water needs, and agricultural production. The construction of the Preferred Alternative would eliminate or further degrade these man-made jurisdictional waters but would maintain existing agriculture-based functions and services.

Project direct impacts on federal recovery plan areas include the creation of permanent partial barriers to special-status species, the loss or degradation of special-status plant and wildlife species, and the loss or degradation of the lands that could support or provide habitat for these species.

The Final EIR/EIS describes that the Bakersfield Hybrid Alternative and Bakersfield Hybrid station portion of the Preferred Alternative would result in a loss of satellite area for the *Recovery Plan for Upland Species of the San Joaquin Valley*. These portions of the Preferred Alternative that would cause this impact are not, however, part of the portion of the Preferred Alternative proposed for approval in conjunction with these findings (Final EIR/EIS, pp. 157-158, 160, 162-63.)

Project period activities would result in the permanent removal or modification of protected trees, which could conflict with the objectives, goals, and/or provisions identified in approved local, regional, or state conservation plans. Where the alignment is located at-grade, removal or trimming of all protected trees is anticipated. In urban areas where the majority of the landscaped ornamental trees are located and where the alignment is on an elevated structure, trimming and limited removal of protected trees would occur.

Indirect (BIO #7) Project Impacts

Indirect impacts would include contamination of habitats of concern outside the construction footprint from increased erosion, sedimentation, siltation, and runoff due to alterations in topography and hydrology; wind erosion effects; an increased risk of fire in adjacent open spaces; and the introduction of noxious plant species from increased human activity/disturbance.

Permanent indirect impacts on special-status plant communities, including riparian areas, would include fragmentation and introduction of nonnative, invasive plant species. These changes would result in decreased viability and gradual loss of special-status plant communities. Fragmentation would result from the construction of permanent features, especially linear features, including track that bisects contiguous natural areas. Project activities could facilitate the spread of nonnative, invasive plant species through introduction of seeds by construction and operation equipment, vehicles, and personnel.

Potential indirect impacts on jurisdictional waters include a number of temporary construction related impacts and permanent water-quality-related impacts: erosion, siltation, and runoff into natural and constructed water features and deposition downstream of the construction footprint. In addition, permanent changes to jurisdictional waters within the Preferred Alternative may also result in changes in hydrology to areas outside of the footprint. For many of the man-made features these indirect impacts would be minor, and hydrologic changes would be minimal. However, for natural features such as seasonal wetlands, and vernal pools and swales (located outside the project footprint) the changes may result in changes in the natural hydrological regime. In some areas the hydroperiod may be either reduced, or extended where sheet flow is limited. Indirect impacts on seasonal riverine include the changes in water temperature through the removal of the riparian trees that provide shade, shading of open water, and reduced contribution to and ability to recycle nutrients. These indirect impacts would adversely affect adjacent or downstream jurisdictional waters up to 250 feet from the project disturbances.

Indirect impacts on portions of vernal pools and swales that abut but occur outside on either side of the footprint are categorized and identified as "indirect-bisected" impacts. Indirect impacts would occur where these features occur within the footprint; however, given the highly sensitive nature of these features, vernal pools and swales will be mitigated as though directly impacted. These features are sensitive to disturbance; therefore, indirect-bisected impacts could result in either significant changes in the hydrological regime, or complete and permanent loss, as a result of drilling, excavation, or other activities that occur within the footprint. These impacts would potentially alter the surface and subsurface water flow within the watershed, affecting the hardpan, volume, and flow direction. Because these impacts would not result from the direct removal or placement of fill material, and are more severe than other indirect impacts described above, these indirect-bisected impacts would adversely affect adjacent or downstream sensitive jurisdictional waters up to 250 feet from project disturbances.

Project indirect impacts on satellite and linkages areas within the USFWS *Recovery Plan for Upland Species of the San Joaquin Valley, California* would occur as a result of implementation of the project. These indirect impacts include fragmentation of habitats where recovery areas are crossed by permanent project elements and disturbance of natural lands, which reduces habitat value for special-status species recovery.

Direct and indirect impacts on habitats of concern during the project period are a significant impact.

Implementation of the following mitigation measures will reduce BIO Impact #7 to less than significant (due to length, the text of the biological resources mitigation measures are presented separately in Attachment F to these CEQA Findings).

Construction and Project Mitigation Measures BIO-MM#16 through BIO-MM#65.

Project impacts on special-status plant communities, jurisdictional waters, conservation areas, and protected trees would be permanent and would result in continued indirect impacts resulting from construction of permanent project elements and train operation. Impacts to special-status plant communities, jurisdictional waters, conservation areas, and protected trees would be reduced by the Mitigation Measures described under BIO Impact #1, #2 and #3 (BIO-MM#1 through BIO-MM#65).

There would be no significant secondary impacts from implementation of these mitigation measures. By minimizing and compensating for direct and indirect impacts to habitats of concern, long-term effects these habitats of concern will be reduced. The Authority finds that combination of the above listed mitigation measures would substantially lessen the direct and indirect impacts to special-status plant communities, jurisdictional waters, conservation areas, and protected trees from project activities by reducing the impact to a less-than-significant level under CEQA.

3.5.7 BIO Impact #8 – Project Effects on Wildlife Movement Corridors

The Preferred Alternative incorporates a number of project design features that would facilitate wildlife movement, including elevated tracks, road overcrossings and undercrossings, and dedicated wildlife crossing structures (as described in Chapter 2, Alternatives). Nevertheless, the placement of the project infrastructure, and the need for ongoing operations and maintenance activities, will cause direct and indirect impacts to wildlife movement corridors during the project period.

Direct (BIO #8) Project Impacts

The project design features of the Preferred Alternative would facilitate wildlife movement; however, direct impacts on wildlife movement may occur. Direct impacts include the placement of temporary and permanent linear barriers to wildlife movement with restricted crossing opportunities. This may cause habitat shifts (toward nonnative and/or disturbed type communities) over time (through direct effects), because it could degrade linkages, which may no longer provide food, cover, or ease of travel for many species. These shifts in habitat use can result in increased competition for resources, as well as the potential for genetic isolation of populations.

Developed areas are generally barriers to natural wildlife movement and are of marginal habitat value to most special status plant and wildlife species. Outside of riparian corridors and known linkages, much of the project footprint has been converted to agricultural or developed urban areas. Although these areas are generally disturbed on a daily-to-seasonal basis, wildlife species that have adapted to urban and agricultural environments may be affected by the placement of barriers, but the impact would be less severe than in natural areas.

The Preferred Alternative is designed on an elevated or viaduct structure in areas identified as riparian and wildlife movement corridor (linkages) areas. These structures would facilitate wildlife movement, but would incrementally affect movement patterns and linkage connectivity in the region. In urban Bakersfield, where the track is predominantly elevated, the Preferred Alternative will not impede wildlife movement. In at-grade sections, security fencing will be installed for safety and security purposes; in these sections wildlife movement will be facilitated through dedicated wildlife movement structures, bridges, road overcrossings and undercrossings, culverts and other drainage facilities.

Indirect (BIO #8) Project Impacts

Implementation of the project (construction of a fully dedicated HST System) may result in indirect disruption of wildlife movement through lighting, noise, motion, and startle effects.

Indirect disturbance from HST operation and maintenance activities (e.g. routine inspection and maintenance of HST right of way) of the habitats associated with a wildlife corridor may cause habitat shifts (toward nonnative and/or disturbed type communities) over time (through indirect effects) because wildlife are no longer able to move freely between areas of natural habitat.

In at-grade crossings the noise screening distance (i.e., distance from the trackway centerline within which an impact could result) for a single-train pass-by sound exposure level (SEL) of 100 dBA would be approximately 100 feet from the track centerline (for a total width of 200 feet). In at-grade crossings where the right-of-way is less than a width of 200 feet and that are adjacent to substantive wildlife habitat (e.g., identified habitat linkages), the HST could expose wildlife to noise levels that exceed the 100-dBA SEL threshold. In such cases indirect effects may cause wildlife to avoid use of a habitat linkage.

Direct and indirect impacts to wildlife movement corridors during the project period are a significant impact.

Implementation of the following mitigation measures will reduce BIO Impact #8 to less than significant (due to length, the text of the biological resources mitigation measures are presented separately in Attachment F to these CEQA Findings):

BIO-MM#51. Install Flashing or Slats within Security Fencing.

BIO-MM#52. Construction in Wildlife Movement Corridors.

BIO-MM#54. Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp.

BIO-MM#55. Implement Conservation Guidelines during project operation for Valley Elderberry Longhorn Beetle.

BIO-MM#56. Compensate for Impacts on California Tiger Salamander.

BIO-MM#57. Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel.

BIO-MM#58. Compensate for Loss of Swainson's Hawk Nesting Trees.

BIO-MM#59. Compensate for Loss of Burrowing Owl Active Burrows and Habitat.

BIO-MM#60. Compensate for Destruction of San Joaquin Kit Fox Habitat.

Impacts to wildlife movement would be reduced by the Mitigation Measures which are described, in part, under BIO Impact # 2, and #6. Impacts to wildlife species will be reduced by preventing access to the HST right of way and directing animals toward wildlife crossing structures by installation of permanent special-status reptile- and mammal-proof fencing consistent with applicable permits as determined in consultation with USFWS and CDFW (BIO-MM#51 Install Flashing or Slats in Security Fencing). A construction avoidance and minimization plan (BIO-MM#52. Construction in Wildlife Movement Corridors) will reduce impacts to special-status wildlife by optimizing the location of dedicated wildlife movement structures, minimizing ground-disturbance in and near identified wildlife movement corridors, particularly during the nighttime hours. Compensation for the impacts to special-status wildlife species will also minimize impacts to wildlife movement corridors because compensatory mitigation will be selected based, among other things, on its significance within the local and/or regional landscape of the Central Valley; consideration of a compensatory mitigation's contribution to landscape-level ecological planning includes lands that offer large, contiguous blocks of high quality habitat, adjacency to or within a matrix of other preserved lands, adjacency to or within wildlife movement corridors, and opportunities for wildlife linkages. (BIO-MM#54 Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp, BIO-MM#55 Implement Conservation Guidelines during project operation for Valley Elderberry Longhorn Beetle, BIO-MM#56 Compensate for Impacts on California Tiger Salamander, BIO-MM#57 Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel, BIO-MM#58 Compensate for Loss of Swainson's Hawk Nesting Trees, BIO-MM#59 Compensate for Loss of Burrowing Owl Active Burrows and Habitat, and BIO-MM#60 Compensate for Destruction of San Joaquin Kit Fox Habitat).

The Authority finds that the combination of the project design and its incorporation of dedicated wildlife crossings, as well as the combination of the above-listed mitigation measures, including permanent preservation of areas that provide habitat linkages, will substantially lessen the impacts to wildlife movement corridors during the project period from the Preferred Alternative by reducing the impacts to a less than significant level under CEQA.

3.6 Hazardous Materials and Waste (Section 3.10 in the Final EIR/EIS)

With implementation of the recommended mitigation measure identified in the finding for HMW Impact # 4, below, the project would not result in any significant and unavoidable impacts related to hazardous materials and waste. This conclusion is further supported by the Project Design Features that the Authority has included as part of the project, consistent with and in

furtherance of the Statewide Program EIR/EIS commitments. (See Attachment A; see also Final EIR/EIS, Section 3.10.6 and Appendix 2-D of the Final EIR/EIS.) These design features would minimize impacts due to hazardous materials as they relate to the proper transport, storage, use and disposal of hazardous materials, preparation of plans to handle unforeseen spills or undocumented contamination to reduce the exposure of workers and the public and the spread of contaminants, and specific investigation of properties before acquisition to remove or avoid contaminated areas to reduce exposure of workers and the public to hazardous material, including the following: In adopting the resolution of approval of the project, the Authority confirms that the Project Design Features are part of the project.

3.6.1 HMW IMPACT #4 - Temporary Hazardous Material and Waste Activities in the Proximity of Schools

During construction, demolition, and excavation activities, the project would potentially emit hazardous air emissions or handle extremely hazardous wastes above threshold quantities referenced in Public Resources Code section 21151.4 and described in Health and Safety Code Section 25532(j). Nine schools are located in the vicinity (0.25 mile) of potential construction activities for the Preferred alternative north of 7th Standard Road. (Final EIR/EIS, Table 3.10-5.) Potentially hazardous materials and items containing potentially hazardous materials would be used in railway construction. Demolition of existing structures within the construction footprint could require the removal of asbestos containing materials and lead-based paint from the project site.

Because the project would comply with the above Public and Health and Safety codes, as well as all other federal, state, and local regulations related to the transport, handling, and disposal of hazardous waste, the effect of HST construction related to routine transport and handling of hazardous or acutely hazardous materials within 0.25 mile of an existing or proposed school would have a less than significant impact.

The effect of hazardous materials released to the environment in the unlikely event of a leak or spill as the result of an accident or collision during construction would largely be minor because of the generally small quantities of materials transported or used at any given time and because of the precautions required by existing State and federal regulations. However, in the most unlikely and extreme case, such a release could be a significant impact.

HMW-MM#1: Limit use of extremely hazardous materials near schools during construction. The contractor shall not handle an extremely hazardous substance (as defined in California Public Resources Code Section 21151.4) or a mixture containing extremely hazardous substances in a quantity equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of Section 25532 of the Health and Safety Code within 0.25 mile of a school. Prior to construction activities signage would be installed to delimit all work areas within 0.25 mile of a school stopping construction activities from bringing hazardous materials near a school. The contractor would be required to monitor all use of extremely hazardous substances.

The above construction mitigation measure for hazardous materials and wastes is consistent with California Public Resources Code Section 21151.4, and would be effective in reducing the impact to a less-than-significant level. Implementation of the mitigation measure is not expected to result in secondary impacts.

The installation of signage to alert contractors of the presence of nearby schools will result in negligible visual impacts because they will be similar to other traffic signs in school areas. No other secondary impacts would occur in other areas. For this reason, the impacts of this mitigation measure would be less than significant.

The Authority finds that Mitigation Measure HMW-MM#1 has been required in the project and that implementation of this mitigation measure will substantially reduce or avoid the project's impacts associated with temporary hazardous material and waste activities in the proximity of schools; with implementation of Mitigation Measure HMW-MM#1, this impact will be reduced to less than significant.

3.7 Safety and Security (Section 3.11 in the Final EIR/EIS)

With implementation of the recommended mitigation measure identified in the findings for S&S Impact #10 below, the project would not result in any significant and unavoidable safety and security impacts. This conclusion is further supported by the Project Design Features that the Authority has incorporated into the project, consistent with and in furtherance of the Statewide EIR/EIS commitments. (See Attachment A; see also Final EIR/EIS, Section 3.11.6 and Appendix 2-D of the Final EIR/EIS.) In adopting the resolution of approval of the project, the Authority confirms that the Project Design Features that are set forth in Attachment A are part of the project.

3.7.1 S&S IMPACT #10 – Need for Expansion of Existing Fire, Rescue, and Emergency Services Facilities

The Downtown Fresno Station and Kings/Tulare Regional Station-East Station would introduce new passengers into these locations, which could increase the demand for fire and ambulance services. These stations would have onsite security patrols, so no increased demand for police protection at these stations is anticipated. However, there is potential for an impact on emergency response times, which is considered a significant impact.

S&S-MM #1: Monitor response of local fire, rescue, and emergency service providers to incidents at stations and provide a fair share of cost of service. Upon approval of the project, the Authority will monitor service levels in the vicinity of the Fresno and Kings/Tulare Regional Station—East stations, to determine baseline service demands. ("Service levels" consist of the monthly volume of calls for fire and police protection, as well as city- or fire protection district-funded EMT/ambulance calls that occur in the station service areas.)

Prior to operation of the stations for HST service, the Authority will enter into an agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share of services above the average baseline service demand level or in order to maintain acceptable response times for the station service areas (as established during the monitoring period). The fair share will be based on the percentage increase in demand created by projected passenger use for the first year of operations, with a growth factor for the first 5 years of operation. This cost-sharing agreement will include provisions for ongoing monitoring and future negotiated amendments as the stations are expanded or passenger use increases. Such amendments will be made on a regular basis for the first 5 years of station operation, as will be provided in the agreement. To make sure that services are made available, impact fees will not constitute the sole funding mechanism, although impact fees may be used to fund capital improvements or fixtures (i.e., police substation, additional fire vehicle, on-site defibrillators, etc.) necessary to service delivery.

After the first 5 years of operation, the Authority will enter into a new or revised agreement with the public service providers of fire, police, and emergency services to fund the Authority's fair share of services. The fair share will take into account the volume of ridership, past record and trends in service demand at the stations, new local revenues derived from station area development, and any services that the Authority may be providing at the station.

No secondary effects are anticipated with the above mitigation measure. If the only need for mitigation is the provision of additional emergency response equipment, this mitigation measure will result in no impacts. If the project requires funding of additional public-service facilities, such as a police substation, mitigation may result in impacts on the physical environment. Those impacts would include emissions and fugitive dust from construction equipment, construction-related noise, visual impacts associated with new structures, and impacts on biological and cultural resources that may be present on the site of new structures. Any new or expanded government facilities would be designed and constructed to be consistent with local land use plans, and would be subject to separate site-specific analysis under CEQA, including measures to mitigate impacts. For this reason, it is expected that impacts of mitigation would be less than significant.

The Authority finds that Mitigation Measure S&S-MM #1 has been required in the project and that implementation of this mitigation measure will substantially lower impacts of safety and security hazards. With mitigation, this impact is less than significant.

3.8 Socioeconomics and Communities (Section 3.12 in the Final EIR/EIS)

Under CEQA, economic and social impacts resulting from a project are not environmental impacts (CEQA Guidelines, § 15064, subd. (e)). The Authority has nevertheless incorporated several design features into the project, consistent with, and in furtherance, of the Statewide Programmatic EIR/EIS environmental commitments and mitigation measures. (See Attachment A; see also Final EIR/EIS, Section 3.12.10, Project Design Features.) In adopting the resolution of approval of the project, the Authority confirms that the design features identified in Attachment A are part of the project.

Although economic and social impacts are not environmental impacts within the meaning of CEQA, where a physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project (CEQA Guidelines, Section 15131, Economic and Social Effects). Furthermore, if the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant. (*Ibid.*) The following sets forth the Authority's determination whether the physical change is significant, as determined by the significance criteria listed in Section 3.12.4.3 of the Final EIR/EIS and the requirements set forth in CEQA Guidelines section 15064 subdivision (e) regarding social and economic impacts.

3.8.1 SO IMPACT #6 – Division of Existing Communities and Displacement of Facilities

As explained in the Revised DEIR/Supplemental DEIS and Final EIR/EIS, under CEQA, the effect of a project on a neighborhood or community is significant if a project would create a new physical barrier that isolates one part of an established community from another and potentially results in a physical disruption to community cohesion. Community impacts are therefore typically considered less than significant under CEQA unless they divide an existing community. With respect to the HST project, the Preferred Alternative north of 7th Standard Road has the potential to divide communities by physically removing homes, businesses, and community facilities and placing a new linear project through the community outside of and away from the existing railroad right-of-way.

Much of the Preferred Alternative north of 7th Standard Road would follow existing rail lines in established transportation corridor. In most areas where the alignment would diverge from

existing rail corridors, it would cross rural agricultural land or open space, where, generally, no concentrations of homes, businesses, or community facilities are found. However, some rural residential developments or small, unincorporated communities are present along the alignment. Also, because of the predominance of agricultural activities in the region, the project alignment passes through some agricultural communities consisting of individual or clustered farmsteads on actively farmed lands along the alignment, especially in Fresno and Kings counties.

In Fresno, the project would displace the Fresno Rescue Mission, which provides meals and services, including overnight shelter accommodations for up to 250 persons, and onsite 18-month drug and alcohol recovery program that currently has approximately 110 persons enrolled full-time. It complements services provided to the homeless population by nearby Poverello House. The Fresno Rescue Mission owns and operates other related facilities (and some additional vacant land) in the immediate vicinity, including an emergency family shelter, a food warehouse, and the Save the Children playground. Because the displacement of the Fresno Rescue Mission would result in the division of a community and the loss of access to an important community resource, the impact is significant. With implementation of the mitigation measures identified below, this impact is reduced to less than significant.

Farther south, the project alignment would travel through Kings County, traversing primarily rural agricultural areas. It would bypass the City of Hanford, but would travel through a rural residential development with 25 homes in the vicinity of East Lacey Boulevard and Ponderosa Road (the Ponderosa Road community). In the Ponderosa Road community, seven units are within the project footprint that would be relocated. Remaining homes would be close (less than 200 feet) to the new HST guideway, which would be elevated 40 feet above ground level. The Kings/Tulare Regional Station–East would be built on the elevated guideway in the immediate vicinity of this community, just north of the existing freight-rail tracks. Because the project would affect the community character, social interactions, and community cohesion by displacing several households, and by exposing the remaining residential homes to increased noise and visual impacts, the impacts to the Ponderosa Road community are significant.

The Preferred Alternative north of 7th Standard Road would bypass the city of Corcoran on the eastern side, thereby avoiding impacts to the city of Corcoran, but in doing so would divide the small, unincorporated rural residential community that lies immediately northeast of the city limits, in the vicinity of Newark Avenue, between SR 43 and the irrigation canal. The alignment would pass through the middle of this community, which consists of about 20 homes on adjacent large lots. The HST tracks and associated roadway work would displace about 40% of the homes, and leave some of the remaining homes very close (within 50 to 150 feet) of the HST train tracks. Similar impacts would occur at the smaller enclave of rural residential homes approximately 1 mile to the southeast, in the vicinity of 4th Avenue and Waukena Avenue. The residential displacement occurring in these small, rural residential communities is a significant impact.

South of Shafter, the project would pass the small, unincorporated community of Crome, a cluster of about 25 to 30 homes on the northwestern quadrant of the intersection of 7th Standard Road and Central Valley Highway. The project would relocate Santa Fe Way to the west through Crome to accommodate the HST tracks. This activity would displace approximately one-third (8 to 10) of the homes in Crome and the only non-residential use in the community—a church building that houses both the 7th Standard Pentecostal Church of God and the India Pentecostal Assembly. Because of the magnitude of the displacement (the high proportion of community facilities affected) and the visual and noise impacts that would occur as a result of the project, this is a significant impact.

SO-MM#1: Implement measures to reduce impacts associated with the division of residential neighborhoods. The Authority will minimize impacts associated with the Preferred

Alternative in the rural residential areas around Ponderosa Road/Edna Way east of Hanford, in the Newark Avenue vicinity northeast of Corcoran, the 5th Avenue and Waukena Avenue vicinity east of Corcoran, and Crome, as well as in urban residential areas in Fresno, Corcoran, Wasco, and Shafter by conducting special outreach to affected homeowners and residents to fully understand their unique relocation needs. The Authority will make every effort to locate suitable replacement properties that are comparable to those currently enjoyed by these residents, including constructing suitable replacement facilities if necessary. These replacement properties will be provided consistent with the information regarding comparable replacement dwellings in Appendix 3.12-A Relocation Assistance Program Brochures of the Final EIR/EIS.

In cases where residents wish to remain in the immediate vicinity, the Authority will take measures to purchase vacant land or buildings in the area, and consult with local authorities over matters such as zoning, permits, and moving of homes and replacement of services and utilities, as appropriate. Prior to land acquisition the Authority will conduct community workshops to obtain input from those homeowners whose property would not be acquired, but whose community would be substantially altered by construction of HST facilities, including the loss of many neighbors, to identify measures that could be taken to mitigate impacts on those who remain (including placement of sound walls and landscaping, and potential uses for remnant parcels that could benefit the community in the long term).

SO-MM#2: Implement measures to reduce impacts associated with the division of existing communities. The Authority will minimize impacts associated with Preferred Alternative in the existing communities through a program of additional outreach to homeowners, residents, business owners, and community organizations in affected neighborhoods.

As a part of this program, before land acquisition, the Authority will consult with officials and representatives of community facilities affected by significant noise impacts (e.g., churches and schools) to identify suitable noise abatement measures or to help affected businesses and organizations find more-suitable locations in the community. Similarly, the Authority locate suitable replacement housing for displaced residents, as discussed in SO-MM#1.

Before the completion of final design, the Authority will also conduct community workshops about the future use of the area beneath the rail guideway. These meetings will provide residents the opportunity to identify design and use options that could strengthen community cohesion and be compatible with the character of the impacted community.

A minimum of three facilitated workshops will be held in each of community where elevated rail guideway would be constructed. To maximize attendance and generate awareness of the workshops, the Authority will work with either community organizations, or community leaders within the neighborhoods. A location and time will be selected based on the needs of the community to increase attendance.

Information will be presented at the workshops that give the community options for the future use of the area beneath the rail guideway, as well as an opportunity for individuals to provide feedback. For example, if safety considerations prohibit such uses as bike paths or community gardens, alternatives, such as sculpture gardens or managed landscaping, could be considered. The comments and feedback will be considered in planning for the future use of the sites.

Upon gathering feedback from the community, the Authority will report the finds either through a fourth public workshop, or written report that would be made available to the public.

The Authority will be responsible for implementing the results of the community workshops through project design and through the long-term management of the area beneath the elevated rail guideway. This will involve documenting the desired design concepts, incorporating them into the final design, and facilitating ongoing maintenance. The Authority will identify potential uses

that may be developed in the project right-of-way. These uses will be compatible with the character of the adjacent community and sensitive to project needs (as outlined in the Final EIR/EIS, Section 3.11, Safety and Security). The costs associated with the development of these associated uses and how costs will be paid will be determined during consultations with the affected city, county, or parks district. Furthermore, the parties or entities (i.e., the Authority, local government, park or recreation district, or nonprofit organization) responsible for some ongoing maintenance of these community areas will be determined. There would be no secondary impacts resulting from outreach programs. Secondary impacts from business and residential displacements are discussed in Chapter 3.12.

Mitigation Measure SO-MM#3: Implement measures to reduce impacts associated with the relocation of important facilities. The Authority will minimize impacts resulting from the disruption to key community facilities: Fresno Rescue Mission, the church in Crome, and an important livestock rendering facility (Baker Commodities) in the Hanford area.

The Authority will consult with the appropriate respective parties before land acquisition to assess potential opportunities to reconfigure land use and buildings and/or relocate affected facilities, as necessary, to minimize the disruption of facility activities and services, and also to ensure relocation that allows the community currently served to continue to access these services.

Because many of these community facilities are located in Hispanic communities, the Authority will continue to implement a comprehensive Spanish-language outreach program for these communities as land acquisition begins. This program will facilitate the identification of approaches that would maintain continuity of operation and allow space and access for the types of services currently provided and planned for these facilities. Also, to avoid disruption to these community amenities, the Authority will ensure that all reconfiguring of land uses or buildings, or relocating of community facilities is completed before the demolition of any existing structures.

Because the unique services provided by the rendering facility and the California Department of Food and Agriculture sampling station in Kings County are critical to agricultural operations in the region, relocation of this facility will occur before the existing facility is closed or steps will be taken to ensure that sufficient capacity is available at other facilities so there is no interruption to the services provided.

This mitigation measure will be effective in minimizing the impacts of the project by completing new facilities before necessary relocations, and by involving affected facilities in the process of identifying new locations for their operations.

Mitigation Measure SO-MM-#5: Develop measures to minimize the potential for physical deterioration. The Authority will work with the communities on the design of project features consistent with Technical Memorandum 200.6, Aesthetic Guidelines for Non-Station Structures (Authority 2011a). The guidelines for station and non-station structures allow for contextual design responses to site-specific or unique conditions, or "context sensitive solutions". Context sensitive solutions mean structural aesthetics must respond to local settings with concern for the human scale, building scale, and the vantage points from which the structures will be viewed. Included in the Authority's design principles is the requirement that the structures enhance local environments and community context. Landscaping will be used to visually integrate project structures into the local context with plantings that recreate the natural setting into which they are placed. The aesthetic design of project structures, in combination with landscape and urban design that serve the local community can create a positive contribution to the surrounding visual context and minimize the potential for physical deterioration.

All of the above mitigation measures include plans to conduct outreach activities in affected communities and to consult with property owners; these activities will result in no impacts on the

physical environment. In addition to consultation with affected parties, Mitigation Measure SO-MM#3 will require the reconfiguration of land or construction of replacement structures for community facilities impacted by the HST. Potential impacts on the physical environment from this mitigation would result from construction activities, including emissions and fugitive dust from construction equipment, construction-related noise, visual impacts associated with new structures, and impacts on biological and cultural resources that may be present on the site of new structures. Any new facilities would be designed and constructed to be consistent with local land use plans, and would be subject to separate site-specific analysis under CEQA, including measures to mitigate impacts. For this reason, it is expected that impacts of mitigation would be less than significant.

The Authority finds that Mitigation Measure SO-MM#3 has been required in the project and that implementation of this mitigation measure will reduce the project's impacts to the Fresno Rescue Mission and associated facilities, and the project's impacts to the church in Crome, to less-than-significant levels. As to the remaining impacts described above, the Authority finds that Mitigation Measures SO-MM#1, SO-MM#2, SO-MM#3, and SO-MM#5 have been required in the project and that implementation of these measures will reduce, but will not completely avoid or substantially lessen these impacts. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce these impacts to less-than-significant levels. To the extent that these significant adverse impacts remain significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.8.2 SO IMPACT #7 – Effects to the Regional Agricultural Community

The Preferred Alternative north of 7th Standard Road would displace homes in the unincorporated areas of the region of the four affected counties. Although many of these displacements would occur in areas just outside of city limits, a substantial number of them would be farmsteads that would be displaced by construction of roadway overcrossings. The largest number would occur in Fresno County, where farm homesteads and rural residences would have to be displaced at intervals of approximately every mile or so along the alignment to accommodate new roadway overcrossings. These displacements would cause considerable disruption to the agricultural community south of Malaga in the agricultural areas surrounding Bowles, Monmouth, and similar small farm towns stretching from Kings County to the vicinity of Corcoran.

The displacement of numerous farm homesteads in a region that takes pride in its agricultural heritage and where agriculture is a dominant economic activity would cause disruption not only to the individual property owners but also to the wider agricultural community. Rural neighbors often rely on each other for assistance (e.g., for responding to an emergency, lending resources in the event of unexpected equipment failure, finding extra hands at harvest). This interdependence can build community cohesion, even in areas with low population density, especially where the same families may have been neighbors for many years. Displacement of rural homes can cause substantial disruption to families faced with having to move or replace their established home, along with outbuildings, gardens, irrigation and fencing systems, mature landscaping, and other improvements that have been carefully built over decades or several generations. The broader farming community can also suffer disruption from the displacement of multiple neighbors—who may or may not decide to continue farming in proximity to a new high-speed train line—and through having other farming operations in the area divided by a new linear feature. This disruption to the agricultural community in the rural areas of Fresno and Kings counties is a significant impact.

SO-MM#1: Implement measures to reduce impacts associated with the division of residential neighborhoods. Details regarding SO-MM#1 are described above.

SO-MM#2: Implement measures to reduce impacts associated with the division of existing communities. Details regarding SO-MM#2 are described above.

Mitigation Measure SO-MM-#4: Provide access modifications to affected farmlands.

In cases where partial-property acquisitions result in division of agricultural parcels, the Authority will evaluate with property owner input the effectiveness of providing overcrossings or undercrossings of the HST track to allow continued use of agricultural lands and facilities. This would include the design of overcrossings or undercrossings to allow farm equipment passage. (Refer to Section 3.14, Agricultural Lands, for additional information.) This mitigation measure will be effective because it will maintain access to farmlands for farmers whose property is bisected.

Mitigation Measure SO-MM#5. Details regarding Mitigation Measure SO-#5 are described above.

Implementation of Mitigation Measures SO-MM#1, SO-MM#2, SO-MM#4, and SO-MM#5 will ensure that social and economic impacts to the regional agricultural economy are substantially lessened, which, in turn, will ensure that no significant adverse physical environmental impacts (e.g., blight or substantial deterioration of existing facilities causing visual or other impacts) would result from the economic impact to the regional agricultural community. Furthermore, as explained in the Final EIR/EIS, as farm operations logically reallocate land resources and relocate agricultural facilities and given the regional context of a productive agricultural economy, this impact would be less than significant. (Final EIR/EIS, § 3.12-13.2.)

The Authority finds that Mitigation Measures SO-MM#1, SO-MM#2, SO-MM#4, and SO-MM#5 have been required in the project and that implementation of these measures will substantially lessen or avoid the project's impacts relating to effects on the regional agricultural economy; this impact is less than significant.

3.9 Station Planning, Land Use, and Development (Section 3.13 in Final)

3.9.1 LU IMPACT #1 – Potential for Construction to Alter Land Use Patterns

Construction of the project would result in temporary impacts, including increases in noise levels, dust and other air pollutants, traffic congestion, visual changes, disrupted access to properties and neighborhoods, and temporary use of land for construction fabrication, laydown, and staging areas. Noise, dust, and visual change would inconvenience residents along the Preferred Alternative. For this reason, construction effects would be significant.

AQ-MM#1: Reduce Criteria Exhaust Emissions from Construction Equipment. This mitigation measure will apply to heavy-duty construction equipment used during the construction phase. All off-road construction diesel equipment will use the cleanest reasonably available equipment (including newer equipment and/or tailpipe retrofits), but in no case less clean than the average fleet mix, as set forth in CARB's Non-Road 2007 database. The Authority will require the contractor to document efforts it undertook to locate newer equipment (such as, in order of priority, Tier 4, Tier 3 or Tier 2 equipment) and/or tailpipe retrofit equivalents. The Authority will require the contractor to provide documentation of such efforts, including correspondence with at least two construction equipment rental companies. A copy of each unit's certified tier specification and any required CARB or SJVAPCD operating permit will be made available at the time of mobilization of each piece of equipment. The Authority will require the contractor to keep

a written record (supported by equipment-hour meters where available) of equipment usage during project construction for each piece of equipment.

AQ-MM#2: Reduce Criteria Exhaust Emissions from On-Road Construction

Equipment. This mitigation measure applies to all on-road trucks used to haul construction materials, including fill, ballast, rail ties, and steel. Material hauling trucks will consist of an average fleet mix of equipment model year 2010, or newer, but no less than the average fleet mix for the current calendar year as set forth in CARB's EMFAC 2011 database. The Authority will require the contractor to provide documentation of efforts to secure such fleet mix. The Authority will require the contractor to keep a written record of equipment usage during project construction for each piece of equipment.

AQ-MM#3: Reduce the Potential Impact of Concrete Batch Plants. Concrete batch plants will be sited at least 1,000 feet from sensitive receptors, including daycare centers, hospitals, senior care facilities, residences, parks, and other areas where people may congregate. The concrete batch plant will utilize typical control measures to reduce the fugitive dust, such as water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, central dust collection systems and other suitable technology, to reduce emissions to be equivalent to the U.S. EPA AP-42 controlled emission factors for concrete batch plants.

AQ-MM#4: Offset Emissions through the VERA Program. This mitigation measure will address exceedance of the general conformity applicability and CEQA emissions thresholds for VOC and NOx, and the CEQA emission thresholds for PM10 and PM2.5. The Authority and SJVAPCD will enter into a contractual agreement to mitigate (by offsetting) to net zero the project's actual emissions of VOC, NOx, PM10 and PM2.5 by providing funds for the district's Emission Reduction Incentive Program to fund grants for projects that achieve emission reductions, thus offsetting project-related impacts on air quality. Projects funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of old farm tractors. To lower overall cost, funding for the VERA program to cover estimated construction emissions for any funded construction phase shall be provided at the beginning of the construction phase. At a minimum, mitigation/offsets shall occur in the year of impact, or as otherwise permitted by 40 CFR Part 93 Section 93.163.

N&V-MM#1: Construction Noise Mitigation Measures. During construction the Authority will require the contractor to monitor construction noise to verify compliance with the noise limits as shown in Table 3.4-1 of the Final EIR/EIS. The contractor will be given the flexibility to meet the FTA construction noise limits in the most efficient and cost-effective manner. This can be done by either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. A noise monitoring program will be developed to meet required noise limits, the following noise control mitigation measures will be implemented as necessary, for nighttime and daytime:

- Install a temporary construction site sound barrier near a noise source.
- Avoid nighttime construction in residential neighborhoods.
- Locate stationary construction equipment as far as possible from noise-sensitive sites.
- Re-route construction truck traffic along roadways that will cause the least disturbance to residents.
- During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters.
- Use low-noise emission equipment.
- Implement noise-deadening measures for truck loading and operations.
- Monitor and maintain equipment to meet noise limits.
- Line or cover storage bins, conveyors, and chutes with sound-deadening material.

- Use acoustic enclosures, shields, or shrouds for equipment and facilities.
- Use high-grade engine exhaust silencers and engine-casing sound insulation.
- Prohibit aboveground jackhammering and impact pile driving during nighttime hours.
- Minimize the use of generators to power equipment.
- Limit use of public address systems.
- Grade surface irregularities on construction sites.
- Use moveable sound barriers at the source of the construction activity.
- Limit or avoid certain noisy activities during nighttime hours.
- To mitigate noise related to pile driving, the use of an auger to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur.

N&V-MM#2: Construction Vibration Mitigation Measures. Building damage from construction vibration is only anticipated from impact pile driving at very close distances to buildings. If piling is more than 25 to 50 feet from buildings, or if alternative methods such as push piling or auger piling can be used, damage from construction vibration is not expected to occur. Other sources of construction vibration do not generate high enough vibration levels for damage to occur. When a construction scenario has been established, preconstruction surveys would be conducted at locations within 50 feet of piling to document the existing condition of buildings in case damage is reported during or after construction. The Authority will arrange for the repair of damaged buildings or will pay compensation to the property owner.

AVR-MM#1a: Minimize Visual Disruption from Construction Activities. The project will adhere to local jurisdiction construction requirements (if applicable) regarding construction-related visual/aesthetic disruption. In order to minimize visual disruption, construction will employ the following activities:

- Minimize pre-construction clearing to that necessary for construction.
- Limit the removal of buildings to those that would obstruct project components.
- When possible, preserve existing vegetation, particularly vegetation along the edge of construction areas that may help screen views.
- After construction, regrade areas disturbed by construction, staging, and storage to original contours and revegetate with plant material similar in replacement numbers and types to that which was removed based upon local jurisdictional requirements. If there are no local jurisdictional requirements, replace removed vegetation at a 1:1 replacement ratio for shrubs and small trees, and 2:1 replacement ratio for mature trees. For example, if 10 mature trees in an area are removed, replant 20 younger trees that after 5 to 15 years (depending upon the growth rates of the trees) would provide coverage similar to the coverage provided by the trees that were removed for construction.
- To the extent feasible, do not locate construction staging sites within the immediate foreground distance (0 to 500 feet) of existing residential, recreational, or other high-sensitivity receptors. Where such siting is unavoidable, staging sites will be screened from sensitive receptors using appropriate solid screening materials such as temporary fencing and walls. Any graffiti or visual defacement of temporary fencing and walls will be painted over or removed within 5 business days.

AVR-MM#1b: Minimize Light Disturbance during Construction. Where construction lighting will be required during nighttime construction, shield such lighting and direct it downward in such a manner that the light source is not visible off-site, and so that the light does not fall outside the boundaries of the project site to avoid light spillage off-site.

Secondary impacts from implementation of the above-identified mitigation measures are described in Section 3.2, Air Quality and Global Climate Change, 3.3, Noise and Vibration, and 3.12, Aesthetic and Visual Resources, of these findings as well as in the respective resource chapters of the Final EIR/EIS.

As found in in Section 3.2, Air Quality and Global Climate Change, 3.3, Noise and Vibration, and 3.12, Aesthetic and Visual Resources of these Findings, implementation of the mitigation measures adopted for the Project's construction air quality, construction noise and vibration, and construction effects on aesthetic and visual resources impacts would reduce each of these construction-related impacts to less-than-significant levels. Therefore, implementation of the mitigation measures adopted for these construction impacts would be effective at mitigating or avoiding the noise, dust, and visual changes that would otherwise inconvenience residents along the project. Implementation of the Project Design Features set forth in Attachment A of these Findings and described in Section 4.1 will ensure that the project would not result in any transportation-related land use impacts. For the reasons described in Section 3.12, Socioeconomics, Communities, and Environmental Justice of the Final EIR/EIS, project construction would not result in any significant construction-related socioeconomic or communities impacts. Any use of land for construction fabrication, laydown, and staging areas would be temporary and the land would be restored to its previous use or other compatible use once construction is complete. For these reasons, the project will not result in a significant construction-related land use impacts.

The Authority finds that Mitigation Measures AQ-MM #1, AQ-MM #2, AQ-MM #3, AQ-MM #4, N&V-MM #1, N&V-MM# 2, AVR-MM #1a, and AVR-MM #1b have been required in the project and that implementation of these measures would be effective in reducing the impact from altering land use patterns as a result of construction activities to a less-than-significant level.

3.9.2 LU IMPACT #2 – Permanent Conversion of Existing Land Uses to Transportation Use

The permanent conversion of land from residential, commercial, industrial, community facilities, agricultural and other uses for the project would result in a significant land use impact.

The project would not cause a significant land use impact for the sections of the HST alignment that runs adjacent to the existing railroad right-of-way; in these areas, the project would be compatible with adjacent land uses and consistent with land use plans and policies. Where the alignment diverges from the BNSF Railway and is adjacent to agricultural lands, the HST would convert agricultural land to other uses, but it would not have an indirect effect on the continued use of adjoining agricultural lands for agricultural purposes. Nevertheless, because of the increase in intensity of land use (i.e., transportation uses rather than agricultural uses within the footprint of the alignment), the Final EIR/EIS and these Findings conservatively conclude that this impact would be significant.

The Kings/Tulare Regional Station–East Station would convert approximately 22 acres of agricultural land in unincorporated Kings County into a transportation use. The Authority will work with the City of Hanford and Kings County to discourage growth in the vicinity of the station by restricting onsite parking and encouraging transit uses to the station from downtown Hanford, Visalia, and Tulare, and purchasing agricultural conservation easements from willing sellers of adjacent agricultural lands. However, it is likely that the location of the station at this site would attract at least some transportation-oriented commercial development. While current zoning allows for industrial uses of some of the land adjoining the station, much of the area continues to be zoned for agriculture and is in agricultural use. In addition, current plans and policies of the City of Hanford call for development to the west of the city and not to the east. This is partially due to the lack of sewer conveyance facilities on the eastern edge of Hanford and the expense of

extending this infrastructure out to the site. It should be noted, however, that since the release of the Revised DEIR/Supplemental DEIS, the City of Hanford has indicated it may be extending a sewer line to the east. In particular, a review of the City of Hanford Draft EIR for the Highway 43/198 Commercial Center now indicates that the City is planning to extend a sewer line along East Lacey Boulevard closer to the Kings/Tulare Regional Station – East site. The Fresno to Bakersfield Section Final Project EIR/EIS proposes to further extend that sewer line eastward to the Kings/Tulare Regional Station – East site south along the proposed HST right-of-way to East Lacey Boulevard and then west on East Lacey Boulevard. Nevertheless, the Kings/Tulare Regional Station–East would change the pattern and intensity of the use of the land that could be incompatible with adjacent land uses. The presence of the station is likely to result in some unplanned changes in the use of existing land. Therefore, this impact would be significant.

AG-MM#1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland.

The Authority has entered into an agreement with the DOC California Farmland Conservancy Program to implement agricultural land mitigation for the High-Speed Train Project. The Authority will fund the California Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of impacts and to fund the purchase of agricultural conservation easements from willing sellers in the Fresno to Bakersfield Section. The performance standards for this measure are to preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur, at a replacement ratio of not less than 1:1 for lands that are permanently converted to nonagricultural use by the project. In addition, the Authority will provide an additional increment of Important Farmland mitigation acreage, above the 1:1 ratio minimum, at a level consistent with the terms of a settlement agreement the Authority reached with agricultural interests in *County of Madera, et al. v. California High-Speed Rail Authority*. This approach will provide a consistent approach to calculating the total amount of acres of agricultural conservation easements across the Central Valley.

The California Farmland Conservancy Program will work with local, regional, or statewide entities whose purpose includes the acquisition and stewardship of agricultural conservation easements. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements. These will include, but are not limited to, provisions to ensure that the easements will conform to the requirements of Public Resources Code Section 10252 and to prioritize the acquisition of willing seller easements on lands that are adjacent to other protected agricultural lands or that would support the establishment of greenbelts and urban separators.

Although implementation of AG-MM#1 will not avoid the significant impact of converting Important Farmland to HST project use, the Authority nevertheless finds that AG-MM#1 will substantially lessen this impact by providing compensation in the form of permanently preserved Important Farmlands that otherwise may be converted to non-agricultural use. The Authority further finds that this mitigation measure will be effectively implemented based on the strong record of success by the DOC California Farmland Conservancy program in securing agricultural conservation easements in the Central Valley, as well as the success of other farmland preservation programs in the Central Valley. The Authority finds, however, that because Important Farmland is not a renewable resource, and the creation of new Important Farmland is not feasible, the HST project will cause a net loss of the Important Farmland resource in the study area. In light of the net loss of the resource, the conversion of Important Farmlands land to non-agricultural use from the HST project cannot be mitigated to a less-than-significant level and this impact is therefore considered significant and unavoidable. Additional mitigation measures suggested by commenters are discussed in Section 6.6.

There would be no secondary impacts resulting from this mitigation measure. This mitigation measure would be effective given the nationwide and local success of farmland preservation programs using agricultural conservation easements and the experience of the DOC California Farmland Conservancy program. However, because the mitigation does not anticipate the creation of new farmland (e.g., conversion of natural lands to agriculture), the mitigation measure would not reduce impacts to less than significant.

The Authority finds that Mitigation Measure AG-MM #1 has been required in the project and that implementation of this measure would substantially reduce, but not completely avoid or mitigate the project's permanent conversion of existing uses to transportation use. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-significant level. To the extent that this significant adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.9.3 LU IMPACT #3 – Land Use Effects of Parking Demand at Station Sites

There are no existing parking facilities at the Kings/Tulare Regional Station–East, or in the vicinity of the proposed station. The Kings/Tulare Regional Station–East would change the pattern and intensity of the use of the land in order to meet the projected parking demand of the proposed station and would be incompatible with adjacent land uses. The presence of the station is likely to result in some unplanned changes in the use of existing adjacent land, and could indirectly contribute to changes that are incompatible with adjoining land uses. Therefore, the land use effect of the Kings/Tulare Regional Station–East would have a significant impact would be significant regardless of the amount of parking provided at the station.

AG-MM#1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. Details regarding AG-MM#1 are described above.

There would be no secondary impacts resulting from this mitigation measure. This mitigation measure would be effective given the nationwide and local success of farmland preservation programs using agricultural conservation easements and the experience of the DOC California Farmland Conservancy program. Although implementation of AG-MM#1 will not avoid the significant impact of converting Important Farmland to HST project use, the Authority nevertheless finds that AG-MM#1 will substantially lessen this impact by providing compensation in the form of permanently preserved Important Farmlands that otherwise may be converted to non-agricultural use. The Authority further finds that this mitigation measure will be effectively implemented based on the strong record of success by the DOC California Farmland Conservancy program in securing agricultural conservation easements in the Central Valley, as well as the success of other farmland preservation programs in the Central Valley. The Authority finds, however, that because Important Farmland is not a renewable resource, and the creation of new Important Farmland is not feasible, the HST project will cause a net loss of the Important Farmland resource in the study area. In light of the net loss of the resource, the conversion of Important Farmlands land to non-agricultural use from the HST project cannot be mitigated to a less-than-significant level and this impact is therefore considered significant and unavoidable.

The Authority finds that Mitigation Measure AG-MM #1 has been required in the project and that implementation of this measure would substantially reduce, but not completely avoid or mitigate the land use effects of parking demands at the Kings/Tulare Regional Station–East. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-significant level. To the extent that this significant adverse impact remains

significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.9.4 LU IMPACT #4 – Indirect Effects on Surrounding Land Uses from HST Station

The Kings/Tulare Regional Station-East could indirectly result in development of supporting uses, such as restaurants and rental car agencies, on adjacent lands to serve the traveling public. These changes to adjacent lands would be incompatible with their current land uses and designations. Therefore, the indirect land use impact would be significant.

AG-MM#1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. Details regarding AG-MM#1 are described above.

There would be no secondary impacts resulting from this mitigation measure. This mitigation measure would be effective given the nationwide and local success of farmland preservation programs using agricultural conservation easements and the experience of the DOC California Farmland Conservancy program. Although implementation of AG-MM#1 will not avoid the significant impact of converting Important Farmland to HST project use, the Authority nevertheless finds that AG-MM#1 will substantially lessen this impact by providing compensation in the form of permanently preserved Important Farmlands that otherwise may be converted to non-agricultural use. The Authority further finds that this mitigation measure will be effectively implemented based on the strong record of success by the DOC California Farmland Conservancy program in securing agricultural conservation easements in the Central Valley, as well as the success of other farmland preservation programs in the Central Valley. The Authority finds, however, that because Important Farmland is not a renewable resource, and the creation of new Important Farmland is not feasible, the HST project will cause a net loss of the Important Farmland resource in the study area. In light of the net loss of the resource, the conversion of Important Farmlands land to non-agricultural use from the HST project cannot be mitigated to a less-than-significant level and this impact is therefore considered significant and unavoidable.

The Authority finds that Mitigation Measure AG-MM #1 has been required in the project and that implementation of this measure would substantially reduce, but not completely avoid or mitigate the indirect effects on surrounding land uses from the Kings/Tulare Regional Station-East. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-significant level. To the extent that this significant adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.9.5 LU IMPACT #5 – Potential for Future Increased Density at HST Stations

Indirect changes to adjacent lands at the Kings/Tulare Regional Station-East would substantially change the pattern and intensity of land use in a way that would be incompatible with adjacent land uses. These changes to adjacent lands would be incompatible with their current land uses and designations. Therefore, the indirect land use impact would be significant.

AG-MM#1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. Details regarding AG-MM#1 are described above.

There would be no secondary impacts resulting from this mitigation measure. This mitigation measure would be effective given the nationwide and local success of farmland preservation programs using agricultural conservation easements and the experience of the DOC California Farmland Conservancy program. Although implementation of AG-MM#1 will not avoid the significant impact of converting Important Farmland to HST project use, the Authority nevertheless finds that AG-MM#1 will substantially lessen this impact by providing compensation in the form of permanently preserved Important Farmlands that otherwise may be converted to non-agricultural use. The Authority further finds that this mitigation measure will be effectively implemented based on the strong record of success by the DOC California Farmland Conservancy program in securing agricultural conservation easements in the Central Valley, as well as the success of other farmland preservation programs in the Central Valley. The Authority finds, however, that because Important Farmland is not a renewable resource, and the creation of new Important Farmland is not feasible, the HST project will cause a net loss of the Important Farmland resource in the study area. In light of the net loss of the resource, the conversion of Important Farmlands land to non-agricultural use from the HST project cannot be mitigated to a less-than-significant level and this impact is therefore considered significant and unavoidable.

The Authority finds that Mitigation Measure AG-MM #1 has been required in the project and that implementation of this measure would substantially reduce, but not completely avoid or mitigate the potential land use effects associated with potential for future increased density and TOD development at the Kings/Tulare Regional Station–East. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-significant level. To the extent that this significant adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.10 Agricultural Lands (Chapter 3.14 of the Final EIR/EIS)

3.10.1 AG IMPACT #4 - Permanent Conversion of Agricultural Land to Nonagricultural Use

The Preferred Alternative would permanently convert approximately 3472 acres of Important Farmland to non-agricultural use to construct HST infrastructure and ancillary facilities. Important Farmland includes farmland classified as prime, unique, statewide important, and locally important as shown on maps prepared for the Department of Conservation's Farmland Mapping and Monitoring Program. Included within this acreage are remnant parcels identified to be unlikely to continue to support agricultural use due to their size, shape, access, location, or other factors. The permanent conversion of Important Farmland to non-agricultural use is a significant impact.

The following measure mitigates this impact:

AG-MM #1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. The Authority has entered into an agreement with the DOC California Farmland Conservancy Program to implement its agricultural land mitigation for the HST project in the Merced to Fresno and Fresno to Bakersfield sections. The Authority will fund the California Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of impacts and to fund the purchase of agricultural conservation easements from willing sellers in the Fresno to Bakersfield section. The performance standards for this measure are to preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur, at a replacement ratio

of not less than 1:1 for lands that are permanently converted to agricultural use by the project. In addition, the Authority will provide an additional increment of Important Farmland mitigation acreage, above the 1:1 minimum ratio, at a level consistent with the terms of a settlement agreement the Authority reached with agricultural interests in *County of Madera, et al. v. California High-Speed Rail Authority*. This approach will provide consistency in calculating the total amount of acres of agricultural conservation easements across the Central Valley.

The California Farmland Conservancy Program will work with local, regional, or statewide entities whose purpose includes the acquisition and stewardship of agricultural conservation easements. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements. These will include, but are not limited to, provisions to ensure that the easements will conform to the requirements of Public Resources Code Section 10252 and to prioritize the acquisition of willing seller easements on lands that are adjacent to other protected agricultural lands or that would support the establishment of greenbelts and urban separators.

Although implementation of AG-MM#1 will not avoid the significant impact of converting Important Farmland to HST project use, the Authority nevertheless finds that AG-MM#1 will substantially lessen this impact by providing compensation in the form of permanently preserved Important Farmlands that otherwise may be converted to non-agricultural use. The Authority further finds that this mitigation measure will be effectively implemented based on the strong record of success by the Department of Conservation California Farmland Conservancy Program in securing agricultural conservation easements in the Central Valley, as well as the success of other farmland preservation programs in the Central Valley. The Authority finds, however, that because Important Farmland is not a renewable resource, and the creation of new Important Farmland is not feasible, the HST project will cause a net loss of the Important Farmland resource in the South San Joaquin Valley, which is the State's leading agricultural production region. In light of the net loss of the Important Farmland resource, the Authority finds that the conversion of Important Farmlands land to non-agricultural use from the HST Project cannot be mitigated to a less-than-significant level. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-significant level. To the extent that this impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.10.2 AG IMPACT#6 - Effects on Land under Williamson Act or FSZ Contracts, Local Zoning, or Conservation Easement Lands

The Preferred Alternative will affect land currently under Williamson Act contracts and Farmland Security Zone contracts. Specifically, the Authority will acquire right of way needed for HST facilities, and in the process it may split a parcel of land that is currently under a Williamson Act or FSZ contract in a manner that leaves the private property owner with a privately owned remainder parcel that may be physically farmable, but is now smaller than the minimum qualifying size under County rules for Williamson Act and FSZ tax benefits. The Final EIR conservatively identifies the potential for the Preferred Alternative to cause land (including Important Farmland) currently under a Williamson Act or FSZ contract to no longer qualify for the tax benefits, and to potentially be converted to non-agricultural use, as a significant impact under CEQA. For the Preferred Alternative, there is a possible conversion of 333 acres of Williamson Act contracted land, and 14 acres of FSZ contracted land, not all of which is Important Farmland.

The following measure mitigates this impact:

AG-MM #1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland.

The Authority has entered into an agreement with the DOC California Farmland Conservancy Program to implement its agricultural land mitigation for the HST project in the Merced to Fresno and Fresno to Bakersfield sections. The Authority will fund the California Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of impacts and to fund the purchase of agricultural conservation easements from willing sellers in the Fresno to Bakersfield section. The performance standards for this measure are to preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur, at a replacement ratio of not less than 1:1 for lands that are permanently converted to agricultural use by the project. In addition, the Authority will provide an additional increment of Important Farmland mitigation acreage, above the 1:1 minimum ratio, at a level consistent with the terms of a settlement agreement the Authority reached with agricultural interests in *County of Madera, et al. v. California High-Speed Rail Authority*. This approach will provide consistency in calculating the total amount of acres of agricultural conservation easements across the Central Valley.

The California Farmland Conservancy Program will work with local, regional, or statewide entities whose purpose includes the acquisition and stewardship of agricultural conservation easements. The Authority and California Farmland Conservancy Program will develop selection criteria under this agreement to guide the pursuit and purchase of conservation easements. These will include, but are not limited to, provisions to ensure that the easements will conform to the requirements of Public Resources Code Section 10252 and to prioritize the acquisition of willing seller easements on lands that are adjacent to other protected agricultural lands or that would support the establishment of greenbelts and urban separators.

The Authority finds that this mitigation measure has been required in the project and that it will permanently protect more than 3472 acres of Important Farmland from conversion to a non-agricultural use, whereas AG-Impact# 6 has the potential to remove 333 acres of land under Williamson Act contracts and 14 acres of land under FSZ contracts from temporary protections provided by tax benefits. The Authority thus finds that AG-MM#1 provides ten times more permanently protected acres of Important Farmland than land that may lose temporary protection under Williamson Act and FSZ contracts. The Authority also finds that AG-MM#1 will be effectively implemented based on the strong record of success by the DOC California Farmland Conservancy program in securing agricultural conservation easements in the Central Valley, as well as the success of other farmland preservation programs in the Central Valley. Based on the magnitude of permanently preserved acres of Important Farmland under AG-MM#1 relative to the number of acres that potentially could lose Williamson Act and FSZ contract tax benefits, and based on the fact that of those lands, not all are Important Farmland, the Authority finds that this impact is substantially lessened and reduced to a less than significant level.

The Authority further finds that Fresno, Kings, Tulare, and Kern counties have both jurisdiction over and procedures in place to allow for a variance in minimum parcel size for Williamson Act and FSZ contracts, depending on the size of the remainder parcel and its proximity to other parcels the owner may have under a separate contract, that has the potential to further minimize the significant impact of additional agricultural land conversion. The Authority finds that these counties can and should allow for landowners to apply for and receive a variance to maintain Williamson Act and FSZ contracts where the remainder parcel size falls below the county minimum and above the state's minimum parcel size, but would otherwise qualify for a variance under each county's procedures and rules.

3.11 Parks, Recreation, and Open Space (Section 3.15 in the Final EIR/EIS)

3.11.1 PK IMPACT #1 – Common Aesthetic and Visual Quality Construction Impacts on Parks, Recreation, Open-Space Impacts, and School District Recreation Facilities

Construction of the Preferred Alternative north of 7th Standard Road could cause visual degradation in areas adjacent to parks, recreational areas, open space areas, and school district recreation facilities.

The following measures mitigate this impact:

AVR-MM#1a Minimize Visual Disruption from Construction Activities. The project will adhere to local jurisdiction construction requirements (if applicable) regarding construction-related visual/aesthetic disruption. In order to minimize visual disruption, construction will employ the following activities:

- Minimize pre-construction clearing to that necessary for construction.
- Limit the removal of buildings to those that would obstruct project components.
- When possible, preserve existing vegetation, particularly vegetation along the edge of construction areas that may help screen views.
- After construction, regrade areas disturbed by construction, staging, and storage to original contours and revegetate with plant material similar in replacement numbers and types to that which was removed based upon local jurisdictional requirements. If there are no local jurisdictional requirements, replace removed vegetation at a 1:1 replacement ratio for shrubs and small trees, and 2:1 replacement ratio for mature trees. For example, if 10 mature trees in an area are removed, replant 20 younger trees that after 5 to 15 years (depending upon the growth rates of the trees) would provide coverage similar to the coverage provided by the trees that were removed for construction.
- To the extent feasible, do not locate construction staging sites within the immediate foreground distance (0 to 500 feet) of existing residential, recreational, or other high-sensitivity receptors. Where such siting is unavoidable, staging sites will be screened from sensitive receptors using appropriate solid screening materials such as temporary fencing and walls. Any graffiti or visual defacement of temporary fencing and walls will be painted over or removed within 5 business days.

AVR-MM#1b: Minimize Light Disturbance during Construction. Where construction lighting will be required during nighttime construction, the contractor will be required to shield such lighting and direct it downward in such a manner that the light source is not visible off-site, and so that the light does not fall outside the boundaries of the project site to avoid light spillage offsite.

There would be no secondary impacts resulting from this mitigation measure. Although the visual degradation during construction would be more noticeable in urban areas adjacent to residences and parkways, the construction activities are considered temporary as they would cease after completion. Implementation of AVR-MM#1b would substantially lessen or avoid impacts associated with the use of nighttime lighting during construction by reducing the amount of nighttime lighting emitted by construction sites and avoiding off-site light spillage visible to viewers. The Authority finds that Mitigation Measures AVR-MM#1a and AVR-MM#1b have been

required in the project and that implementation of Mitigation Measure AVR-MM#1a will substantially lessen or avoid impacts associated with the visual disturbance during construction, and that implementation of Mitigation Measure AVR-MM#1b will substantially reduce the amount of nighttime lighting emitted; therefore these impacts are less than significant.

3.12 Aesthetics and Visual Resources (Section 3.16 in the Final EIR/EIS)

3.12.1 AVR IMPACT #2 –Construction Impact on Existing Visual Quality

Clearing, earthmoving, and erection of project facilities would introduce new lines, forms, and colors that would typically contrast with the existing landscape forms and patterns in urban and rural areas causing a decrease in the visual unity and intactness of most existing views. This would be most noticeable in rural areas where largely pastoral scenes would be disturbed by intensive construction activities, causing a reduction in the visual quality of landscapes by one to two levels of visual quality depending on the setting. Most construction activities would cease within 1 to 2 years at any given location. The exception to this would be concrete batch plants used to fabricate project components and some construction laydown areas that would be used for up to 5 years. Because construction could reduce the visual quality category of a landscape by one or two levels, depending upon the setting and viewer sensitivity would often be moderate or, in some cases, high, the effect of project construction on existing visual quality is significant.

AVR-MM#1a Minimize Visual Disruption from Construction Activities. The project will adhere to local jurisdiction construction requirements (if applicable) regarding construction-related visual/aesthetic disruption. In order to minimize visual disruption, construction will employ the following activities:

- Minimize pre-construction clearing to that necessary for construction.
- Limit the removal of buildings to those that would obstruct project components.
- When possible, preserve existing vegetation, particularly vegetation along the edge of construction areas that may help screen views.
- After construction, regrade areas disturbed by construction, staging, and storage to original contours and revegetate with plant material similar in replacement numbers and types to that which was removed based upon local jurisdictional requirements. If there are no local jurisdictional requirements, replace removed vegetation at a 1:1 replacement ratio for shrubs and small trees, and 2:1 replacement ratio for mature trees. For example, if 10 mature trees in an area are removed, replant 20 younger trees that after 5 to 15 years (depending upon the growth rates of the trees) would provide coverage similar to the coverage provided by the trees that were removed for construction.
- To the extent feasible, do not locate construction staging sites within the immediate foreground distance (0 to 500 feet) of existing residential, recreational, or other high-sensitivity receptors. Where such siting is unavoidable, staging sites will be screened from sensitive receptors using appropriate solid screening materials such as temporary fencing and walls. Any graffiti or visual defacement of temporary fencing and walls will be painted over or removed within 5 business days.

Implementation of this mitigation measure is not expected to result in secondary impacts.

Although the visual degradation during construction would be more noticeable in urban areas adjacent to residences and parkways, particularly the Fresno downtown area, the construction activities are considered temporary as they would cease after completion.

The Authority finds that Mitigation Measure AVR-MM#1a has been required in the project and that implementation of this mitigation measure will substantially lessen or avoid impacts associated with the visual disturbance during construction; this impact will be reduced to less than significant.

3.12.2 AVR IMPACT #3 –Construction Impacts from Light and Glare

Project construction would create new sources of light and glare that may temporarily affect nighttime views. Lighting associated with nighttime construction would increase ambient light, which may adversely affect nighttime views. This may be an annoyance in urban areas, such as Fresno, Wasco, and Shafter; it may also be an annoyance in rural residential areas along all of the HST alignment. Construction would not occur at night at all times; therefore, this impact would be intermittent over the construction period. Construction at any given location would typically last 1 to 2 years, although construction activities at concrete batch plants and some construction laydown areas would last for up to 5 years. Because construction light and glare could be an annoyance to viewers particularly in rural areas, reducing the visual quality category of a landscape by one level, depending upon the setting, and because viewer sensitivity would often be moderate or, in some cases, high, the impact would be significant.

AVR-MM#1b: Minimize Light Disturbance during Construction. Where construction lighting will be required during nighttime construction, the contractor will be required to shield such lighting and direct it downward in such a manner that the light source is not visible off-site, and so that the light does not fall outside the boundaries of the project site to avoid light spill offsite.

Implementation of this mitigation measure is not expected to result in secondary impacts.

The Authority finds that Mitigation Measure AVR-MM #1b has been required in the project and that implementation of AVR-MM #1b will substantially lessen or avoid impacts associated with the use of nighttime lighting during construction this impact would be reduced to a less-than-significant impact.

3.12.3 AVR IMPACT #4 – Lower Visual Quality in the Rural Valley/Agricultural Landscape Unit

As described in Section 3.16.4 of the Final EIR/EIS, the San Joaquin Valley Rural/Agricultural Landscape Unit makes up the great majority of the project. Panoramic views toward the Sierra Nevada are among the aesthetic and visual resources present throughout the Central Valley. Other natural aesthetic amenities in the area include vast areas comprising a mix of orchards and open field crops. The operation of the HST would result in permanent changes to the visual quality in this landscape. These visual changes would occur through new features introduced in the environment, including the HST elevated guideways, guideway support columns, contact power system, bridges and roadway grade separations, and a variety of HST infrastructure, such as traction power substations, HST alignment fencing, required sound walls up to 14 feet high in some locations, and the HST itself. These features would be incompatible and out of scale with the existing visual character in many locations in the Rural Valley/Agricultural Landscape Unit to rural residents, the only viewer group identified with both high viewer sensitivity and exposure to the HST project in the San Joaquin Valley/Agricultural Landscape Unit. These viewers would experience a decline in visual quality of one to two levels in areas where scenes do not include agro-industrial facilities. This reduction in visual quality would be experienced by rural residents

for a distance of 0.25 mile where the HST is at-grade and 0.5 mile where the HST is elevated. Rural residents abutting the Kings/Tulare Regional Station—East would also experience a significant decline in visual quality.

AVR-MM#2a: Incorporate Design Criteria for Elevated Elements That Can Adapt to Local Context.

During final design of the elevated guideways and the Kings/Tulare Regional stations, the Authority will coordinate with local jurisdictions on the design of these facilities so that they are designed appropriately to fit in with the visual context of the areas near them. This will include the following activities:

- For stations: During the station design process, establish a local consultation process with the cities and communities surrounding the Kings/Tulare Regional Station, as necessary, to identify and integrate local design features into the station design through a collaborative, context-sensitive solutions approach. The process will include activities to solicit community input in their respective station areas. This effort will be coordinated with the station area planning process that will be undertaken by those cities under their station area planning grants.
- For elevated guideways in unincorporated communities: During the elevated guideway design process, establish a process with the city or county with jurisdiction over the land along the elevated guideway to advance the final design through a collaborative, context-sensitive solutions approach. Participants in the consultation process will meet on a regular basis to develop a consensus on the urban design elements that are to be incorporated into the final guideway designs. The process will include activities to solicit community input in the affected neighborhoods.

Actions taken to help achieve integration with the local design context during the context-sensitive solutions process will include the following:

- Design HST stations and associated structures such as elevators, escalators, and walkways to be attractive architectural elements or features that add visual interest to the streetscapes near them.
- Design HST station parking structures and adjacent areas to integrate visually into the areas where they would be located. Where the city has adopted applicable downtown design guidelines, the parking structures and adjacent areas will be designed to be compatible with the policies and principles of those guidelines.
- For the elevated guideways and columns, incorporate architectural elements, such as graceful curved or tapered sculptural forms and decorative surfaces, to provide visual interest. Include decorative texture treatments on large-scale concrete surfaces such as parapets and other portions of elevated guideways. Include a variety of texture, shadow lines, and other surface articulation to add visual and thematic interest. Closely coordinate the design of guideway columns and parapets with station and platform architecture to promote unity and coherence where guideways lie adjacent to stations.
- Integrate trees and landscaping into the station streetscape and plaza plans where possible to soften and buffer the appearance of guideways, columns, and elevated stations. This will be consistent with the principles of crime prevention through environmental design.
- For the stations, structures, and related open spaces: incorporate design features that provide interest and reflect the local design context. These features could include landscaping, lighting, and public art.

The designs in cities and unincorporated communities will reflect the results of the context-sensitive solutions design process. During the context-sensitive solutions design process, the HST project's obligations and constraints related to planning, mitigation, engineering, performance, funding, and operational requirements will be taken into consideration.

AVR-MM#2b: Integrate Elevated Guideway into Affected Cities, Parks, and Trail Designs. During development of the final design, the Authority will work with the affected cities and counties to develop a project site and landscape design plan for the areas disturbed by the project. As a result of following these plans, the design features identified in AVR-MM#2a and the park mitigation measure PK-MM#3 will be implemented.

AVR-MM#2c: Screen At-Grade and Elevated Guideways Adjacent to Residential Areas. Consistent with the design features developed under AVR-MM#2a, the Authority will plant trees along the edges of the rights-of-way in locations adjacent to residential areas. This will help reduce the visual contrast between the elevated guideway and the residential area. The species of trees to be installed will be selected on the basis of their mature size and shape, growth rate, hardiness, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The crowns of trees used should ultimately be tall enough so that upon maturity they will partially, or fully, block or screen views of the elevated guideway from adjacent at-grade areas. Trees should allow ground-level views under the crowns (with pruning if necessary) while not interfering with the 15-foot clearance requirement for the guideway. The trees will be continuously maintained and appropriate irrigation systems will be installed within the tree planting areas.

AVR-MM#2d: Replant Unused Portions of Lands Acquired for the HST. After construction is complete, the Authority will plant vegetation within lands acquired for the project (e.g., shifting roadways) that are not used for the HST or related supporting infrastructure. Plantings will allow adequate space between the vegetation and the HST alignment and catenary lines. All street trees and other visually important vegetation removed in these areas during construction will be replaced with similar vegetation that, upon maturity, will be similar in size and character to the removed vegetation. The Authority will ensure that vegetation will be continuously maintained and appropriate irrigation systems will be installed within the planting areas. The Authority will ensure that landscaped areas will be continuously maintained and appropriate irrigation systems will be installed. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted.

AVR-MM#2e: Provide Offsite Landscape Screening Where Appropriate. Where onsite landscape screening measures as described under AVR-MM#2d cannot provide effective screening to significantly affected high-sensitivity receptors such as nearby rural residential areas, provide offsite screening, as appropriate, if desired by affected residential owners.

AVR-MM#2f: Landscape Treatments along the HST Project Overcrossings and Retained Fill Elements of the HST. Upon the completion of construction, the Authority will plant the surface of the ground supporting the overpasses (slope-fill overpasses) and retained fill elements with vegetation consistent with the surrounding landscape in terms of vegetative type, color, texture, and form. During final design, the Authority will consult with the affected cities and counties regarding the landscaping program for planting the slopes of the overcrossings and retained fill. Plant species will be selected on the basis of their mature size and shape, growth rate, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The landscaping will be continuously maintained and appropriate irrigation systems will be installed if needed. Where wall structures supporting the overpasses or retained fill are proposed, the structure will employ architectural details and low-maintenance trees and other vegetation to screen the structure, minimize graffiti, and reduce the effects of large walls. Surface coatings will be applied on wood and concrete to

facilitate cleaning and the removal of graffiti. Any graffiti or visual defacement or damage of fencing and walls will be painted over or repaired within a reasonable time after notification.

AVR-MM#2g: Provide Sound Barrier Treatments. The Authority will design a range of sound barrier treatments for visually sensitive areas, such as those where residential views of open landscaped areas would change or in areas where sound barriers would adversely affect the existing character and setting (see the description of sound barriers in Table 3.16-2 in the Final EIR/EIS). The Authority will develop the treatments during final design and integrate them into the final project design. The treatments will include, but are not limited to, the following:

- Sound barriers along elevated guideways may incorporate transparent materials where sensitive views would be adversely affected by solid sound barriers.
- Sound barriers will use non-reflective materials and will be of a neutral color.
- Surface design enhancements and vegetation appropriate to the visual context of the area will be installed with the sound barriers. Vegetation will be installed consistent with the provisions of AVR-MM#2f. Surface enhancements will be consistent with the design features developed under AVR-MM#2a, and will include architectural elements (i.e., stamped pattern, surface articulation, and decorative texture treatment as determined acceptable to the local jurisdiction. Surface coatings will be used on wood and concrete sound barriers to facilitate cleaning and the removal of graffiti.

AVR-MM#2h: Screen Traction Power Distribution Facilities. Upon completion of station construction, the Authority will screen the traction power distribution facilities, including substations (located at approximately 30-mile intervals along the Preferred Alternative) and radio communications towers, from public view through the use of landscaping or solid walls/fences. This will consist of context-appropriate landscaping of a type and scale that does not draw attention to the station. Plant species will be selected on the basis of their mature size and shape, growth rate, hardiness, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The landscaping will be continuously maintained and appropriate irrigation systems will be installed within the landscaped areas. Walls will be constructed of cinder-block or similar material and will be painted a neutral color to blend in with the surrounding context. If a chain-link or cyclone fence is used, it will include wood slats in the fencing. Any graffiti or visual defacement or damage of fencing and walls will be painted over or repaired within a reasonable period as agreed between the Authority and local jurisdiction.

None of the mitigation measure options is expected to result in secondary effects. The mitigation measures are typical of visual treatments applied on linear transportation facilities; they have been defined to be specific in range and implementable according to context, and designed in coordination with local jurisdictions.

The Authority finds Mitigation Measures AVR-MM#2a, AVR-MM#2b, AVR-MM#2c, AVR-MM#2d, AVR-MM#2e, AVR-MM#2f, AVR-MM#2g, and AVR-MM#2h have been required in the project and that implementation of these measures would reduce, but not completely avoid or substantially lessen the permanent impacts on the views, visual character, and visual quality within rural areas. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce these impacts to less-than-significant levels. To the extent that these significant adverse impacts remain significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.12.4 AVR IMPACT #4 – Lower Visual Quality in the Wasco and Shafter Landscape Units

The presence of at-grade and elevated structures, HSTs, road overcrossings, or other prominent project features would substantially impact the existing visual character and quality of the site and its surroundings. The substantial degradation of existing visual quality in the Wasco and Shafter Landscape Units is considered a significant impact. The HST would degrade visual quality and character by blocking views, changing the views and landscape, and therefore would be a significant impact. Notably, visual impacts in the town of Corcoran would be avoided by the Corcoran Bypass alignment, which is part of the Preferred Alternative (Final EIR/EIS, p. 3.16-146; see also Final EIR/EIS, Table 3.16-4).

AVR-MM#2a: Incorporate Design Criteria for Elevated and Station Elements That Can Adapt to Local Context. Details regarding AVR-MM#2a are described above.

AVR-MM#2b: Integrate Elevated Guideway into Affected Cities, Parks, Trail, and Urban Core Designs. Details regarding AVR-MM#2b are described above.

AVR-MM#2c: Screen At-Grade and Elevated Guideways Adjacent to Residential Areas. Details regarding AVR-MM#2c are described above.

AVR-MM#2d: Replant Unused Portions of Lands Acquired for the HST. Details regarding AVR-MM#2d are described above.

AVR-MM#2e: Provide Offsite Landscape Screening Where Appropriate. Details regarding AVR-MM#2e are described above.

AVR-MM#2f: Landscape Treatments along the HST Project Overcrossings and Retained Fill Elements of the HST. Details regarding AVR-MM#2f are described above.

AVR-MM#2g: Provide Sound Barrier Treatments. Details regarding AVR-MM#2g are described above.

AVR-MM#2h: Screen Traction Power Distribution Facilities. Details regarding AVR-MM#2h are described above.

None of the mitigation measure options is expected to result in secondary effects. The mitigation measures are typical of visual treatments applied on linear transportation facilities; they have been defined to be specific in range and implementable according to context, and designed in coordination with local jurisdictions.

The Authority finds that Mitigation Measures AVR-MM#2c, AVR-MM#2d, AVR-MM#2e, AVR-MM#2f, AVR-MM#2g, and AVR-MM#2h, have been required in the project and that implementation of these measures would reduce, but not completely avoid or substantially lessen the permanent impacts on the views, visual character, and visual quality within the Wasco and Shafter landscape units. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce these impacts to less-than-significant levels. To the extent that these significant adverse impacts remain significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.12.5 AVR-IMPACT #4 – Traction Power Distribution Facilities Would Alter Visual Character or Block Views

The Preferred Alternative north of 7th Standard Road would require the placement of Traction Power Distribution Facilities of varying sizes at intervals along the alignment, which would potentially alter the visual character of adjacent lands and/or block views toward areas beyond the alignment.

The substantial degradation of existing visual quality or character of the site and its surroundings is considered a significant impact. The traction power distribution facilities would degrade visual quality and character by blocking views, changing the views and landscape, and therefore would be a significant impact.

AVR-MM#2h: Screen Traction Power Distribution Facilities. Details regarding AVR-MM#2h are described above.

Depending on the size and location of the traction power distribution stations, there could be impacts with substantial impacts. However, these facilities are located distant from sensitive viewers or can be screened such that over time they become integrated into the landscape. Where appropriate, stations would be screened from public view by landscaping and a wall or fence.

The Authority finds that Mitigation Measure AVR-MM #2h is required in the project and that implementation of AVR-MM #2h will substantially lessen or avoid impacts associated with the traction power distribution facilities; therefore, this impact will be reduced to less than significant.

3.12.6 AVR IMPACT #4 – Sound Barriers Would Lower Visual Quality or Block Views

The Preferred Alternative would require the use of sound barriers along portions of the guideway in urbanized areas, potentially lowering visual quality and/or blocking existing views, depending on the barrier location and materials.

The substantial degradation of existing visual quality or character of the site and its surroundings is considered a significant impact. The sound barriers would degrade visual quality and character by blocking views, changing the views and landscape, and therefore would be a significant impact.

AVR-MM#2a: Incorporate Design Criteria for Elevated and Station Elements That Can Adapt to Local Context. Details regarding AVR-MM#2a are described above.

AVR-MM#2b: Integrate Elevated Guideway into Affected Cities, Parks, Trail, and Urban Core Designs. Details regarding AVR-MM#2b are described above.

AVR-MM#2c: Screen At-Grade and Elevated Guideways Adjacent to Residential Areas. Details regarding AVR-MM#2c are described above.

AVR-MM#2d: Replant Unused Portions of Lands Acquired for the HST. Details regarding AVR-MM#2d are described above.

AVR-MM#2e: Provide Offsite Landscape Screening Where Appropriate. Details regarding AVR-MM#2e are described above.

AVR-MM#2f: Landscape Treatments along the HST Project Overcrossings and Retained Fill Elements of the HST. Details regarding AVR-MM#2f are described above.

AVR-MM#2g: Provide Sound Barrier Treatments. Details regarding AVR-MM#2g are described above.

None of the mitigation measure options is expected to result in secondary effects. The mitigation measures are typical of visual treatments applied on linear transportation facilities; they have been defined to be specific in range and implementable according to context, and designed in coordination with local jurisdictions.

Mitigation Measure AVR-MM#2g requires the Authority to design a range of sound barrier treatments for visually sensitive areas. This mitigation measure will be implemented in conjunction with Mitigation Measure N&V-MM#3, which has been adopted to mitigate the project's noise impacts, although not every operational noise impact can be reduced to less-than-significant levels. Mitigation Measure N&V-MM#3 requires the Authority to work with the communities to determine the height of the sound barriers based on jointly developed performance criteria. To minimize visual impacts of the sound barriers, the barriers could be combined with sound insulation or higher noise thresholds than the FRA's current noise thresholds could be accepted. In other words, implementation of mitigation measures AVR-MM#2g and N&V-MM#3 may involve a trade-off between reducing visual impacts and reducing noise impacts, depending on input received from the community.

The Authority finds that Mitigation Measures AVR-MM#2a, AVR-MM#2b, AVR-MM#2c, AVR-MM#2d, AVR-MM#2e, AVR-MM#2f, and AVR-MM#2g have been required in the project and that implementation of this measure will reduce, but not completely avoid or substantially lessen the visual impacts of sound barriers. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-significant level. To the extent that this significant adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

3.13 Cultural and Paleontological Resources (Section 3.17 in the Final EIR/EIS)

This section sets forth the Authority's CEQA findings concerning the impacts of the Preferred Alternative north of 7th Standard Road on cultural and paleontological resources. Because the project is also a federal undertaking, the project is subject to NEPA and Section 106 of the National Historic Preservation Act (NHPA), which provides considerable protection for cultural resources. The development of the management documents and treatment plans pursuant to Section 106 regulations involve extensive impact analysis, project re-design, consultation with Native Americans, and other consultation with agencies to develop a plan that provides for the best possible preservation planning and other mitigation measures for the resource present at the project site. As described below, the Section 106 process is a separate, but complementary, method for protection for cultural resources, distinct from CEQA.

As explained in the Final EIR/EIS, a Programmatic Agreement (PA) to satisfy the requirements of Section 106 for the project has been signed by the FRA, the Authority, the ACHP, the SHPO, and consulting parties. The PA provides an overall regulatory framework for conducting the Section 106 process throughout the HST System and the documentation process for the Fresno to Bakersfield Section was conducted in accordance with the PA.

The PA also presents the approach for treatment of historic properties, including development of a Memorandum of Agreement (MOA) for each HST section to address the resolution of adverse effects on historic properties, defined as those cultural objects, sites, or districts that meet the

eligibility criteria for listing in the National Register of Historic Places.⁸ The MOA stipulates the treatment measures that will be applied for cultural resources impacted by the project and calls for the development of two treatment plans: an Archaeological Treatment Plan (ATP) and a Built Environment Treatment Plan (BETP). The ATP and BETP will set forth a prescriptive process by which these treatment measures will be applied to each known resource and will outline measures for the phased identification of historic properties as additional parcel access is obtained and design work is completed. The MOA and treatment plans provide specific performance standards that ensure each impact will be avoided, minimized, or mitigated to the extent possible and provide enforceable performance standards to follow the NRHP and the Secretary of Interior's (SOI's) standards and guidelines when implementing the mitigation measures (see Stipulations III and VIII in the PA, Appendix 3.17-A.) The Treatment Plans will conform to the principles of the Advisory Council on Historic Preservation's Treatment handbook, as well as SHPO Guidelines. These treatment plans dictate how the requirements of Section 106 will be met and also include the mitigation measure requirements.

3.13.1 CUL IMPACT #1 - Potential Adverse Effects on Archaeological Resources Caused by Construction Activities

As explained in the Revised DEIR/Supplemental DEIS, there are generally no known archeological sites that qualify as historical resources or unique archaeological resources are in the project study area. However, there is one recorded site, CA-TUL-473, which would be affected by the Allensworth Bypass alignment. This site is described as a "sparse scatter of lithic debitage and artifacts spread over a plowed field." Given the proximity of this site to Tulare Lake, it was probably a large site that has been disturbed and re-deposited over a large area. Due to the amount of re-deposition or spreading the site has experienced, no intact or discrete deposit at this location is currently recorded. The site area is currently the location of bermed holding ponds that are flooded as part of Alpaugh Irrigation District activities. Legal access to the parcel has not yet been obtained so there is currently insufficient information available to determine whether the site is eligible for the NRHP, or hence the CRHR, until additional testing is conducted at the site. As a result, and as part of the overall Section 106 responsibilities directed by the PA, and the MOA, additional surveys and potential testing will take place at the location of CA-TUL-473 and vicinity. Once more data are available, a more comprehensive evaluation of the site's integrity and importance will be determined as prescribed by in the PA and described below under the Mitigation Measures Cul-MM#1 through CUL-MM#5.

In addition, unknown or unrecorded archaeological resources, including subsurface buried archaeological deposits, may exist, but are currently unknown. Construction activities related to ground disturbance in some areas could contain such unknown resources. Unknown resources could also exist in areas where field surveys could not be conducted because permission to enter (PTE) was not granted. As such, construction of the HST could result in possible adverse effects on unknown archaeological deposits from ground-disturbing construction operations associated with the project, or in areas where PTE has not been granted. Unknown archaeological sites might represent the full range of prehistoric or historic activities conducted over time from prehistoric lithic scatters and village sites, to historic era homestead remains, to human burials. Although the MOA for the Fresno to Bakersfield Section establishes mitigation measures to be implemented before, during, and after construction to ensure that construction activities would avoid and minimize these adverse effects or changes, to the extent possible, these operations

⁸ The California Register of Historical Resources (CRHR) is derived from the federal process; a resource considered eligible for the NRHP is assumed eligible for the CRHR. The criteria for listing are similar to those of NRHP.

would likely cause substantial adverse changes in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5 and is therefore considered a potentially significant impact.

Cul-MM#1: Complete Inventory for Archaeological Resources and Comply with the Stipulations Regarding the Treatment of Archaeological Resources in the PA and MOA. The Authority will complete the following management steps for currently inaccessible areas once permission to enter has been obtained:

- The Authority will complete an inventory and evaluation report for archaeological resources.
- This work will be led or supervised by cultural resources specialists who meet the SOI's professional qualification standards provided in 36 C.F.R. Part 61.
- All newly identified resources will be mapped and described on Department of Parks and Recreation (DPR) forms, which have been established to map cultural resources. Mapping will be completed by recording data with global position system (GPS) hardware through which data can be imported and managed in Geographic Information Systems. Mapping of previously identified resources will be limited to updates of existing records where necessary to describe the current boundaries of the resource and any change in condition that has occurred after the first recordation.
- The Authority will evaluate the eligibility of identified archaeological and built environment resources for listing on the CRHR.
- Under delegated authority provided in the PA and MOA, the Authority, in consultation with the FRA, will also evaluate identified archaeological resources for the NRHP.
- For archaeological resources that are NRHP-eligible, the Authority, in consultation with the FRA, will assess the potential for adverse effects within the meaning of 36 C.F.R. Part 800.5(a)(1). For CRHR-eligible resources, the Authority will assess the potential for significant impacts by applying the criteria in CEQA Guidelines 15064.5(b).
- For CRHR-eligible archaeological resources, the Authority shall determine if these resources can feasibly be preserved in place, or if data recovery is necessary. The methods of preservation in place will be considered in the order of priority provided in CEQA Guidelines Section 15126.4(b)(3). If data recovery is the only feasible treatment, the Authority will adopt a data recovery plan as required under CEQA Guidelines Section 15126.4(b)(3)(C).
- In addition to completion of inventory and evaluation for the larger project, the Authority will evaluate all existing cultural resources on compensatory mitigation sites. If any currently known archaeological sites on the compensatory mitigation sites are CRHR-eligible, they will be preserved in place. The Authority will prepare additional CEQA documentation describing the CRHR eligibility of all archaeological resources on compensatory mitigation sites. This documentation will comply with the requirements of CEQA Guidelines Sections 15162 through 15164.
- For archaeological resources, the Authority will also determine if the resource is a unique archaeological site. If the resource is not an historical resource but is an archaeological site, the resource will be treated as required in California Public Resources Code 21083.2.

Cul-MM#2: Conduct Archaeological Training. Before the start of ground-disturbing activities within the APE, a qualified professional archaeologist who meets the SOI Standards for Archaeology will develop a training program and printed material to be presented to construction personnel. The purpose of this training and accompanying materials will be to familiarize

construction personnel with the relevant legal (Section 106/NEPA/CEQA) context for cultural resources of the project and with the types of cultural sites, features, and artifacts that could be uncovered during construction activities. These training sessions will be conducted before commencing construction within the Area of Potential Effect (APE) and will be repeated as needed as construction crews and supervisors change.

Cul-MM#3: Conduct Archeological Monitoring in Areas of Sensitivity, Halt Work in the Event of an Archaeological Discovery. Prior to ground-disturbing construction the Authority will include a monitoring plan in the contract conditions of the construction contractor, identifying the following steps to be taken in the event of the inadvertent discovery of cultural resources.

- An archaeological monitor will be present to observe construction at geographic locations that are sensitive for unidentified cultural resources. Such locations may consist of construction areas near identified cultural resources where ground-disturbing construction will occur in proximity to major water features, or in other areas of identified sensitivity based on inventory work to be completed when permission to enter is granted.
- In the event of an archaeological resource discovery, work will cease in the immediate vicinity of the find, based on the direction of the archaeological monitor or the apparent location of cultural resources if no monitor is present. A qualified archaeologist will assess the significance of the find and make recommendations for further evaluation and treatment as necessary. These steps shall include evaluation for the CRHR and NRHP and necessary treatment to resolve significant effects if the resource is an historical resource or historic property. If the resource is an historical resource (eligible for the CRHR) and an archaeological resource methods of preservation in place shall be considered in the order of priority provided in CEQA Guidelines § 15126.4(b)(3). If data recovery is the only feasible mitigation, the Authority will adopt a data recovery plan as required under CEQA Guidelines § 15126.4(b)(3)(C).

The California State Lands Commission (CSLC) will be notified if the find is a cultural resource on or in the submerged lands of California and consequently under the jurisdiction of the CSLC. The Authority will comply with all applicable rules and regulations promulgated by CSLC with respect to cultural resources in submerged lands. The Authority will also comply with the PA. Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.

The mitigation measures described above and provided in the Archaeological Treatment Plan (ATP) are consistent with best practices within the professional archaeological community and are commensurate with mitigation measures for similar scale transportation projects. They have proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is based upon successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.

CUL-MM#4: Comply with State and Federal Law for Human Remains. Discoveries of human remains on private and state agency lands in California are governed by California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98. Native American remains discovered on federal lands are governed by the Native American Graves Protection and Repatriation Act (NAGPRA) (25 US Code Section 3001).

Pursuant to Stipulation XIII of the PA, if human remains are discovered on state-owned or private lands the Authority shall contact the relevant County Coroner to allow the Coroner to determine if an investigation regarding the cause of death is required. If no investigation is required and the remains are of Native American origin the Authority shall contact the Native

American Heritage Commission (NAHC) to identify the appropriate Native American tribal representative to consult with about the disposition of the remains and any funerary objects.

If human remains are part of an archaeological site the Authority shall, in consultation with the Native American tribal representatives and other stakeholders, consider preservation in place as the first option, in the order of priority called for in CEQA Guidelines Section 15126.4(b)(3).

In consultation with the relevant Native American stakeholders, the Authority may conduct scientific analysis on the human remains if called for under a data recovery plan and amenable to all stakeholders. California and the Authority will work with the most likely descendant, to satisfy the requirements of California Public Resources Code Section 5097.98. Performance tracking of this mitigation measure will be based on successful implementation and approval of the documentation by the SHPO and appropriate consulting parties.

Cul-MM#5: Conduct Additional Testing and Data Recovery for CA-TUL-473

Additional inventory and evaluation is needed CA-TUL-473, a sparse scatter of lithic debitage and artifacts spread over a plowed field. The general vicinity of the site is located in a sensitive archaeological region given the proximity to Tulare Lake and the abundant resources the lake likely provided in prehistory. The site area is currently the location of bermed holding ponds that are flooded as part of Alpaugh Irrigation District activities, and as a result it was probably a large site that has been disturbed and re-deposited over a large area. Due to the amount of re-deposition or spreading the site has experienced, no intact or discrete deposit at this location was recorded. Due to lack of access there was not enough information available to determine whether the site is eligible for the NRHP or the CRHR. Therefore, an archaeological testing program will be implemented to help identify whether substantial archaeological deposits exist within the APE at the recorded location of CA-TUL-473 when access to the parcel is obtained.

When access to the parcel is obtained, surveys and evaluative testing for CA-TUL-473 is required in order to assess the site's integrity and significance. Work will include a thorough pedestrian survey of the site followed by the excavation of surface transect units across the site. This work will include a combined program of auguring, trenching, and surface transect units to be placed throughout the site boundaries.

Should the testing determine that intact deposits are present at the recorded location of CA-TUL-473, work will include controlled excavation of areas with indications of intact subsurface deposits and the site will be evaluated for significance in accordance with the procedures outlined in the ATP. If the deposits are found significant under Section 106 and CEQA, additional provisions found in the ATP for data recovery will be followed if avoidance is determined to be infeasible.

None of the mitigation measure options is expected to result in secondary effects.

The Authority finds that Mitigation Measures CUL-MM#1, CUL-MM#2, CUL-MM#3, CUL-MM#4 and CUL-MM#5 have been required in the project and that implementation of these measures will reduce construction impacts on archaeological resources to less than significant even if data recovery is the only feasible mitigation.

3.13.2 CUL IMPACT #2 – Potential Adverse Effects on Historic Architectural Resources due to Construction Activities

Construction activities that may cause impacts on historic architectural resources can include excavation, staging, heavy-equipment usage and movement, drilling, demolition, or the need for relocation, as well as increases in vibration levels or introduction of new visual elements. The MOA for the Fresno to Bakersfield Section ensures that treatments implemented before, during, and after construction would avoid, minimize, and mitigate these impacts. Nevertheless, the

construction of the project would cause substantial adverse direct changes to 5, and indirect changes to 9 historical properties or resources (see Final EIR/EIS, Table 3.17-7). Furthermore, additional built environment surveys may be necessary as project design progresses and those surveys may identify additional historical resources. A substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 is considered a significant impact. For these reasons, built environment resources may be subject to treatment for significant mitigatable or unavoidable effects.

Cul-MM#6: Complete Inventories for Historic Architectural Resources. It may be necessary to conduct additional inventories for historic architectural resources as the design is finalized. The Authority, in consultation with the FRA, under delegated responsibility under the PA and MOA, shall complete inventory and evaluate historic architectural properties for the NRHP. The Authority will also evaluate historic architectural resources to determine if they are historical resources (CRHR-eligible). For identified NRHP historic properties the Authority, in consultation with the FRA, will assess the potential for adverse effects by applying the effects criteria in 36 C.F.R. Part 800.5(a)(1). For CRHR historic resources the Authority shall assess the potential for significant impacts by applying the criteria in CEQA Guidelines 15064.5(b).

CUL-MM#7: Avoid and/or Monitor Adverse Construction Vibration Effects. The HST project will develop construction methods to avoid indirect adverse effects or indirect substantial adverse change to any historic properties (Section 106) or historical resources (CEQA) from vibration caused by construction activities. Vibration from impact pile-driving during construction is anticipated to reach up to 0.12 in/sec ppv at 135 feet from the project centerline, a level that could cause the physical destruction, damage, or alteration of historic properties or historical resources if the pile-driving is within 80 to 140 feet of the building. Because impact pile-driving could cause adverse effects or substantial adverse changes, alternative construction methods causing less than 0.12 in/sec ppv measured at the receptor will be used for construction activities near historic properties or historical resources if they are determined to be susceptible to vibration damage at or above 0.12 in/sec ppv (Authority and FRA 2012e). The use of alternative construction methods that create less vibration, such as cast in drilled hole construction, at these locations would avoid indirect adverse vibration effects on historic properties (Section 106) and would avoid substantial adverse vibration changes to historical resources (CEQA). Indeed, any construction method that produces less than 0.12 in/sec ppv will be below the threshold for damage to older buildings (Wilson, Ihrig, & Associates et al. 2012; Ted Lindberg, personal communication, 2014). Implementation of avoidance measures will be monitored to ensure that damaging vibration levels are avoided during construction adjacent to the historic properties identified as requiring this treatment.

The mitigation measure described above is consistent with FRA's High-Speed Ground Transportation Noise and Vibration Impact Assessment (2005) for evaluation of noise and vibration impacts associated with HSTs. The Built Environment Treatment Plan (BETP), as required under the PA, will describe the methodology for the avoidance of adverse vibration effects in more detail and how such avoidance will be monitored and implemented during construction of the project.

CUL-MM#8: Implement Protection and/or Stabilization Measures. The BETP identifies historic properties/historical resources that may require protection and/or stabilization before the start of construction of the project. Properties subject to this mitigation activity include those that would be physically affected by the project, properties that would be relocated, and properties in close-enough proximity to require protection to avoid effects. This treatment will allow the project to avoid adverse effects on historic properties/historical resources outright or will minimize those effects to the extent possible. Application of this treatment would reduce significant impacts under CEQA to a less-than-significant level.

This treatment will be developed and implemented in consultation with the Authority, the landowner or land-owning agencies as well as the State Historic Preservation Officer (SHPO) and the MOA signatories, as required by the PA. Such measures will include, but will not be limited to, vibration monitoring of construction in the vicinity of historic properties; cordoning off of resources from construction activities (e.g., traffic, equipment storage, personnel); shielding of resources from dust or debris; and stabilization of buildings adjacent to construction. For buildings that would be moved, treatment will include stabilization before, during, and after relocation; protection during temporary storage; and relocation at a new site and during subsequent rehabilitation. Moving buildings could result in minor impacts on air emissions from equipment and vehicles and minor effects on developed or undeveloped sites.

Cul-MM#10: Minimize Adverse Effects through Relocation of Historic Structures.

Based upon the finalization of design and the completed inventory, the BETP will identify historic properties/historical resources that could be relocated to help avoid their destruction and minimize the direct adverse effect of their physical damage or alteration. The development of the plan for relocation and the implementation of relocation will take place before construction. The relocation of the historic properties/historical resources will take into account the historic site and layout (i.e., the orientation of the buildings to the cardinal directions) and their potential re-use. The properties subject to relocation will be documented in detailed recordation as described in Cul-MM#12.

The BETP will include input from consulting parties regarding relocation of historic structures to provide a comprehensive and thorough approach that will best meet the needs of the parties and the resources. This minimization measure is consistent with best practices within the professional historic preservation community and is commensurate with treatment of historic properties in similar-scale transportation projects. Relocating historic structures has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this treatment will be identified in the BETP. Application of this treatment will help minimize effects on historic properties (Section 106) or historical resources (CEQA) and will reduce impacts under CEQA to a less-than-significant level.

CUL-MM#11: Minimize Adverse Operational Noise Effects. The BETP identifies any additional historic properties/historical resources that will be subject to treatment to minimize the indirect adverse effects caused by the operational noise of the HST project. Properties subject to this mitigation will be treated in consultation with the landowner or land-owning agencies and the Authority. Preliminary project design options, such as noise walls, have been developed to help reduce noise impacts and follow FRA methodologies for noise abatement. As discussed in Chapter 3.4 of the Final EIR/EIS, assessments and mitigations (see Mitigation Measure N&V-MM#1) for noise exposure levels for sensitive receptors, not just historic buildings, in similar land use areas along the project footprint, would also be protective of historic buildings. Therefore, application of this treatment mitigation coupled with the implementation of N&V-MM#1 would help minimize effects on historic properties (Section 106) or historical resources (CEQA) and could reduce impacts under CEQA to a less-than-significant level.

Cul-MM#12: Prepare and Submit Additional Recordation and Documentation. Based on the finalization of design and the completed inventory, the BETP will identify specific historical resources that would be physically altered, damaged, relocated, or destroyed by the project that will be documented in detailed recordation that includes photography. This documentation may consist of preparation of updated recordation forms (DPR 523), or may be consistent with the HABS, the Historic American Engineering Record (HAER), or the Historic American Landscape Survey (HALS) programs; a Historic Structure Report; or other recordation methods stipulated in the MOA and described in the BETP. The recordation undertaken by this treatment would focus on the aspect of integrity that would be affected by the project for each historic property subject to this treatment. For example, historic properties in an urban setting that would experience an

adverse visual effect would be photographed to capture exterior and contextual views; interior spaces would not be subject to recordation if they would not be affected.

Consultation with the SHPO and the consulting parties will be conducted for the historic architectural resources to be documented. Recordation documents will follow the appropriate guidance for the recordation format and program selected.

Copies of the documentation will be provided to the consulting parties and offered to the appropriate local governments, historical societies and agencies, or other public repositories, such as libraries. The documentation will also be offered in printed and electronic form to any repository or organization to which the SHPO, the Authority, and the local agency with jurisdiction over the property, through consultation, may agree. The electronic copy of the documentation may also be placed on an agency or organization's website.

Performance tracking of this mitigation measure is described in the BETP and is included in the MMRP as part of the CEQA process.

CUL-MM#13: Prepare Interpretive or Educational Materials. Based on the finalization of design and the completed inventory, the MOA and BETP will identify historic properties and historical resources that will be subject for historic interpretation and determine when an interpretive program should be implemented as part of the ongoing consultation with consulting parties and the Authority. Interpretive exhibits will provide information regarding specific historic properties or historical resources and will address the aspect of the significance of the properties that would be affected by the project. Historic properties and historical resources subject to demolition by the project will be the subject of informative permanent metal plaques that will be installed at the site of the demolished historic property or at nearby public locations. Each plaque will provide a brief history of the subject property, its engineering/architectural features and characteristics, and the reasons for and the date of its demolition.

The interpretive exhibits will utilize images, narrative history, drawings, or other material produced for the mitigation described above, including the HABS/HAER/HALS or other recordation and other archival sources. The interpretive exhibits may be in the form of, but are not limited to, interpretive display panels and/or printed material for dissemination to the public. The interpretive exhibits may be installed at local libraries, historical societies, or public buildings.

This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with the treatment of historic properties in similar-scale transportation projects. Preparing interpretive exhibits has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this mitigation measure is described in the BETP and will be included in the MMRP.

CUL-MM#14: Plan Repair of Inadvertent Damage. Based on the completed inventory and any additional inventory that may be required, the BETP provides that the Authority outline a plan for the repair of inadvertent damage to historic properties or historical resources be developed before project construction. The plan will consist of a general protocol for inadvertent damage to historic architectural resources and a listing of specific properties that should be the subject of an individual plan because of their immediate proximity to the project. Inadvertent damage from the project to any of the historic properties or historical resources near construction activities will be repaired in accordance with the SOI's Standards for Rehabilitation. Inadvertent damage will consist of any damage that results in a significant impact to a historical resource within the meaning of CEQA Guidelines Section 15064.5(b)(2) or adverse effects to historic properties within the meaning of 36 C.F.R. Part 800.5(a)(1).

The plan will utilize photographic documentation prepared for the other mitigation measures (such as the documentation associated with the HST or the HABS/HAER/HALS records) as the

baseline condition for assessing damage. The plan will include the protocols for notification, coordination, and reporting to the SHPO and the landowner or land-owning agencies. Before it can be implemented, the repair plan will be submitted for review and comment to the SHPO to verify conformance with the SOI's Standards for Rehabilitation.

This mitigation measure is consistent with best practices within the professional historic preservation community and is commensurate with treatment of historic properties in similar-scale transportation projects. This type of mitigation measure has proven to be effective in achieving the stewardship goals of Section 106 and CEQA review. Performance tracking of this treatment is described in the BETP.

Cul-MM#15: Visual Screening Planting. Based on the finalization of design and the completed inventory, the BETP will identify historic properties and historical resources that will be subject to visual screening planting. Visual screening will consist of plant material that will minimize the view of the project from the property subject to mitigation. This treatment will minimize adverse effects on historic properties/historical resources to the extent possible.

Plant species will be selected on the basis of their mature size and shape, growth rate, and drought tolerance. No species that is listed on the Invasive Species Council of California's list of invasive species will be planted. The landscaping will be continuously maintained and appropriate irrigation systems will be installed if needed. Visual screen planting may be undertaken in the form of boundary planting on the affected property, planting at affected viewpoints, and/or planting on project property as appropriate. This treatment will be developed in consultation with the landowner or land-owning agencies, as well as the SHPO and the MOA signatories, as required by the PA. The visual screen planting treatment will include preparation of a planting plan that utilizes evergreen tree or shrub species and will take into account both the growth rate and ultimate height and density for the selected species to ensure that the visual screen can be accomplished effectively.

None of the mitigation measure options is expected to result in secondary effects. Historical architectural resources would be directly or indirectly adversely affected or experience substantial adverse change from construction activities associated with the Preferred Alternative north of 7th Standard Road.

Execution of the treatments described in the mitigation measures above would avoid, minimize, or mitigate these adverse effects or changes, to the extent possible. Additionally, the MOA for the Fresno to Bakersfield section ensures that treatments implemented before, during, and after construction would avoid, minimize, and mitigate these impacts. The PA and MOA mandate that the BETP will set forth means to avoid, protect, or development treatment measures to minimize the project's effects when the Authority, in consultation with the appropriate agencies, the SHPO, and other MOA signatories, determines that adverse effects cannot be avoided. The BETP will provide specific performance standards to ensure that each impact will be avoided, minimized, or mitigated to the extent possible and provide enforceable performance standards to follow the NRHP and the SOI's standards when implementing the mitigation measures. Although the mitigation measures, which have been developed as part of the Section 106 of the NHPA process, are extremely stringent, it cannot be known, with certainty at this stage in the design process, whether such measures will be effective to mitigate all impacts to the historic built environment to less-than-significant levels.

The Authority therefore finds that Mitigation Measures CUL-MM #6, CUL-MM #7, CUL-MM #8, CUL-MM #10, CUL-MM#11, CUL-MM#12, CUL-MM#13, CUL-MM #14, and CUL-MM # 15 have been required in the project and that implementation of these measures will reduce, but not avoid or substantially lessen the impacts on historic architectural resources due to construction activities. The Authority finds that there are no other feasible mitigation measures or alternatives

that would reduce this impact to less-than-significant levels. To the extent that these significant adverse impacts remain significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project

3.13.3 CUL IMPACT #3 - Potential Adverse Effects on Paleontological Resources Due to Construction Activities

During construction, ground-disturbing activities could disturb sediments with high paleontological sensitivity. Depending on the depth of ground disturbance, construction could directly or indirectly destroy a unique paleontological resource. This is considered a potentially significant impact under CEQA.

CUL-MM#16: Engage a Paleontological Resources Specialist to Direct Monitoring during Construction. A paleontological resources specialist (PRS) will be designated for the project by the Authority and will be responsible for determining where and when paleontological resources monitoring should be conducted. Paleontological resources monitors (PRMs) will be selected by the PRS based on their qualifications (as detailed in Caltrans Standard Environmental Reference, Environmental Handbook, Volume 1, Chapter 8, Paleontology). The scope and nature of their monitoring will be determined and directed based on the Paleontological Resource Monitoring and Mitigation Plan (PRMMP). The PRS will be responsible for developing and implementing the Worker Environmental Awareness Program training. All management and supervisory personnel and construction workers involved with ground-disturbing activities will be required to take this training before beginning work on the project and will be provided with the necessary resources for responding in case paleontological resources are found during construction. The PRS will document any discoveries, as needed, evaluate the potential resource, and assess the significance of the find under the guidance of the recommendations of the Society of Vertebrate Paleontology (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995).

CUL-MM#17: Prepare and Implement a Paleontological Resource Monitoring and Mitigation Plan. Paleontological monitoring and mitigation measures are restricted to those construction-related activities that will result in the disturbance of paleontologically sensitive sediments. The PRMMP will include a description of when and where construction monitoring will be required; emergency discovery procedures; sampling and data recovery procedures; procedures for the preparation, identification, analysis, and curation of fossil specimens and data recovered; and procedures for reporting the results of the monitoring and mitigation program.

The monitoring program will be designed to accommodate site-specific construction of the selected option. The PRMMP will be consistent with Society of Vertebrate Paleontology (SVP 1995) guidelines for the mitigation of construction impacts on paleontological resources. The PRMMP will also be consistent with the SVP (1996) conditions for receivership of paleontological collections and any specific requirements of the designated repository for any fossils collected.

CUL-MM#18: Halt Construction When Paleontological Resources Are Found. If fossil or fossil-bearing deposits are discovered during construction, regardless of the individual making a paleontological discovery, construction activity in the immediate vicinity of the discovery will cease. This requirement will be spelled out in both the PRMMP and the Worker Environmental Awareness Program. Construction activity may continue elsewhere provided that it continues to be monitored as appropriate. If the discovery is made by someone other than a PRM or the PRS, a PRM or the PRS will immediately be notified.

None of the mitigation measure options is expected to result in secondary effects. Surficial activities such as staging and clearing usually do not affect paleontological resources because the

associated disturbance does not extend deep enough to impact paleontological sensitive sediment, but construction activities that may impact paleontological resources include excavation, heavy equipment usage and movement at depth, and drilling. However, with monitoring efforts during construction activities, prepare and implement a monitoring and mitigation plan, procedures to halt work in the case of the discovery of paleontological resources, construction impacts to significant paleontological resources will be substantially lessened or avoided, and reduced to a less-than-significant with implementation of CUL-MM #16, CUL-MM #17, and CUL-MM #18.

The Authority finds that Mitigation Measures CUL-MM # 16, CUL-MM #17, and CUL-MM #18 have been required in the project and that implementation of these measures will substantially lessen or avoid the potentially significant impact of construction on paleontological resources; this impact is less than significant with implementation of these mitigation measures.

3.14 Regional Growth (Section 3.18 in the Final EIR/EIS)

The Preferred Alternative north of 7th Standard Road would induce growth, but would not induce growth substantially beyond what is projected in city and county general plans, other than in unincorporated Kings County, near Hanford, due to proximity of the Kings/Tulare Regional Station. Compared to the No Project Alternative, the Preferred Alternative north of 7th Standard Road would encourage more compact, efficient land use in the region by providing an economic driver for higher-density infill development around the Fresno station in downtown Fresno. These effects would support anticipated regional land use policies consistent with SB 375, and would assist communities in realizing goals in these regional transportation plans.

The Fresno Station would be compatible with the planning goals of Fresno. The station area planning process has been strategized such that the stations would be sited and designed to maximize potential benefits. This process also allows cities to make relevant land use decisions well in advance of any project construction. The City of Fresno, under a station planning grant from the Authority, will develop a site-specific plan to adapt to the potential of a HST station and realize new land use patterns in the city's downtown area. These funds will be used to prepare land use plans for the areas around the stations, including compact development and mixed uses compatible with the Authority's Urban Design Guidelines.

The Kings/Tulare Regional Station—East would be located in an agricultural area because of the HST alternatives bypass the City of Hanford, and the Authority would support local government regulations to continue to discourage growth in the agricultural area around the Kings/Tulare Regional Station—East. In addition the Authority would work with local government, the California Department of Conservation, local land trusts, and farm organizations to identify and acquire agricultural conservation easements to limit the potential of low-density urban development caused by a station, as described in the agricultural mitigation measures (see Section 3.14.7 of the Final EIR/EIS). Pursuant to SB 375, sustainable community strategies (SCS) or alternative planning strategies (APS) planning in each county will likely rely upon HST System development to help reach its greenhouse gas emissions reduction targets of 5% by 2020 and 10% by 2035. These planning processes, together with steps the Authority will take to assist with station area planning, is expected to encourage more compact development within the region, particularly around HST station locations.

4.0 Cumulative Impacts (Section 3.19 of the Final EIR/EIS)

This section presents the Authority's findings regarding the cumulative effects of implementing the Preferred Alternative north of 7th Standard Road in combination with other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from the combination of individually minor but collectively significant projects over a period of time. (CEQA Guidelines, § 15355) Under CEQA, when a project would contribute to a cumulative impact, an EIR must discuss whether the project's incremental effect is "cumulatively considerable." Cumulatively considerable means that the project's incremental effect is significant when viewed in the context of past, present, and reasonably probable future projects. The discussion of cumulative impacts need not provide as much detail as is provided for the effects attributable to the project alone (CEQA Guidelines, § 15130, subd. (b)). As described in the EIR/EIS, the focus of the cumulative impacts analysis is on the Fresno to Bakersfield Section of the HST System and the regional context appropriate for each resource area, including adjacent sections of the HST System.

4.1 Transportation

The cumulative impact analysis for transportation is based on the planned and potential project lists (Appendices 3.19-A and 3.19-B of the Final EIR/EIS), as well as plans/projections listed in Table 3.2-1, Regional Plans and Policies in Section 3.2, Transportation of the Final EIR/EIS.

At a local level, the operation of the Preferred Alternative north of 7th Standard Road in combination with other past, present, and reasonably foreseeable projects would decrease the operating conditions below Level of Service (LOS) D on some roadway segments and at intersections in the vicinity of HST stations—causing a cumulatively significant effect on local traffic congestion. Mitigation measures for transportation that are described in Section 3.1 of these Findings (for impacts under that Future [2035] Plus Project scenario) would reduce these impacts by modifying intersections to improve level of service. These modifications will include widening approaches to intersections, adding exclusive turn lanes to intersections, and/or adding new lanes to roadways. With implementation of these measures, the contribution of the Preferred Alternative north of 7th Standard Road to cumulative local transportation impacts would be reduced to less than cumulatively considerable.

The Authority finds that transportation mitigation measures have been incorporated into the project (see Section 3.1 of these Findings) and that implementation of these mitigation measures will reduce the project's contribution to cumulatively considerable transportation impacts to less-than-cumulatively-considerable levels.

4.2 Air Quality and Global Climate Change

Construction of the Preferred Alternative north of 7th Standard Road would be above the San Joaquin Valley Air Pollution Control District's (SJVAPCD's) significance thresholds for regional criteria pollutants and together with other related projects, this combined impact would be cumulatively significant. In addition, some materials needed for construction of the project, such as ballast, may be sourced to areas outside of the San Joaquin Valley Air Basin (SJVAB). As described in Impact AQ#3, Section 4.2 of these Findings, the transport of ballast construction materials from areas outside the SJVAB to the project site may result in exceedences of NO_x mass emission thresholds in other air districts, thereby contributing to cumulatively considerable air quality impacts.

As explained below, implementation of the project's required mitigation measures will reduce the project's contribution to these cumulatively considerable impacts to less-than-cumulatively-considerable levels.

As described in Section 3.19, Cumulative Impacts, of the Final EIR/EIS, construction of the project would not result in cumulatively significant statewide or local air quality or greenhouse gas emissions impacts. At a regional level, however, the project would have a cumulatively considerable impact on air quality.

Within the SJVAB, for criteria pollutants, the SJVAPCD has adopted a cumulative threshold of significance of 10 tons per year for ozone precursors (ROG and NO_x) and 15 tons per year for particulate matter (PM₁₀ and PM_{2.5}). The SJVAPCD has determined that projects below these significance thresholds would not have a cumulatively considerable impact on air quality in the SJVAB as they are consistent with the SJVAPCD's attainment strategy and would not prevent the District from achieving attainment. Before implementation of mitigation, the project's construction emissions would exceed the SJVAPCD's limits for ROG, NO_x, PM₁₀, and PM_{2.5}, which would be a cumulatively considerable impact. Implementation of the mitigation measures adopted for the project's air quality construction impacts, which are described in Section 3.2 of these Findings, will reduce construction emissions of these criteria pollutants to net zero. In particular, mitigation measure AQ MM#4 offsets construction emissions above the SJVAPCD thresholds for ozone precursors and particulate matter through the Voluntary Emission Reduction Agreement. Therefore, the project's incremental contribution would not be cumulatively considerable.

With respect to the project's air quality impacts in areas outside the SJVAB, implementation of Mitigation Measure AQ-MM#5, which requires the purchase of offsets and emission mitigation for emissions associated with hauling ballast materials, would reduce this impact to less-than-cumulatively-considerable levels.

The Authority finds that construction air quality mitigation measures have been incorporated into the project (see Section 3.2 of these Findings) and that implementation of these mitigation measures will reduce the project's contribution to cumulatively considerable construction air quality impact on regional emissions, both inside and outside the SVAB, to less-than-cumulatively-considerable levels.

4.3 Noise and Vibration

Construction of the Preferred Alternative north of 7th Standard Road, in conjunction with other past, present, and reasonably foreseeable projects would result in noise effects that would be limited in duration. It is possible that multiple projects in urban areas that are in close proximity to the Preferred Alternative north of 7th Standard Road, such as projects developed under the Fulton Corridor Specific Plan, and the North Shafter Sewer Project, would be under construction at the same time as the HST project. Together with the HST project, construction of these projects could result in exceedance of significance thresholds for noise at sensitive receivers. (See Section 3.3.3, Noise and Vibration, of the Final EIR/EIS for the noise significance thresholds.) This would be a significant cumulative impact. Even after implementation of the noise mitigation measures set forth in Section 3.3 of these Findings, the project's contribution to this cumulative construction noise impact would be cumulatively considerable.

Furthermore, although no specific projects have been proposed in the rural areas of the project with construction schedules that overlap the project, it is possible that future construction of commercial, industrial, or infrastructure projects in rural areas could overlap with project construction. This would result in a significant cumulative impact. Even after implementation of

the noise mitigation measures set forth in Section 3.3 of these Findings, the project's contribution to this cumulative construction noise impact would be cumulatively considerable.

Construction of the elevated sections of the project is likely to require pile driving. It is possible that other projects in urban areas that are in close proximity to elevated sections of HST alternatives would also require pile driving. Construction of the project concurrently with such future projects could result in exceedance of significance thresholds for vibration at adjacent sensitive receivers. Even after implementation of the mitigation measures for vibration impacts set forth in Section 3.3 of these Findings, this would be a significant cumulative impact and the project's contribution to this cumulative construction vibration impact would be cumulatively considerable.

In addition, operation of the Preferred Alternative north of 7th Standard Road would create new long-term noise impacts. Increased vehicular traffic along existing and planned roadways and the anticipated increase in the number and length of freight trains along the BNSF Railway would also contribute to future elevated noise levels. Traffic from future land use projects, in combination with traffic related to the Preferred Alternative, is projected to increase noise levels up to 7 dBA day-night sound level, (L_{dn}) between 2010 and 2035 at noise-sensitive receivers. Project's such as the Fresno Freight Alignment project in Fresno, Houston Avenue widening project in Hanford, and the Poso Drive reconstruction in Wasco, could contribute to cumulative increases in traffic volumes, which would increase noise levels. Anticipated increases in the number and length of freight trains would result in a maximum increase of 3 dBA L_{dn} in future railroad noise exposure at noise-sensitive receivers. The HST alternatives would generate noise-level increases up to 28 dBA L_{dn} above projected 2035 noise levels at certain isolated locations; however a majority of the sensitive receivers located adjacent to the HST would not experience such a large increase due to the HST. Together with past, present, and reasonably foreseeable projects, the increased noise levels adjacent to transportation corridors would be a significant cumulative impact for sensitive receivers along the transportation corridors. Even after implementation of the mitigation measures set forth in Section 3.3 of these Findings, the incremental contribution of the project to the significant cumulative noise impact would be cumulatively considerable.

Mitigation measures for the construction noise impacts of the Preferred Alternative north of 7th Standard Road described in Section 3.3 of these Findings, would reduce the project's contribution to cumulative construction noise impacts by activities such as installing temporary and permanent sound barriers, using low-noise emission equipment, limiting or avoiding certain noisy activities during nighttime hours, installation of building sound insulation, acquiring easements on properties severely affected by noise, and using special types of trackwork.

Additionally, during operations, even with implementation of mitigation measures for noise provided in Section 3.3 of these Findings, the project's contribution to cumulative effects of operational noise would remain cumulatively considerable. This contribution would result because there would be some sensitive receptors near the HST alignment for whom additional mitigation is not practical because construction of a sound barrier is not economically feasible and there is no practical amount of sound insulation that can be added to the structure to reduce interior noise levels to acceptable standards.

The following mitigation measure would reduce the potential cumulative effects of overlapping construction activities within the same area.

CUM-N&V-MM#1: Consult with agencies regarding construction activities. To minimize the potential overlapping noise-generating construction activities within the same area, the Authority would consult with local city and county planning departments and other agencies as determined necessary. Consultation would entail notifying the departments/agencies regarding

the anticipated HST construction schedule and would allow for adjustment of construction schedules for adjacent projects or projects in close proximity to the HST alignment, to the extent feasible.

However, even with implementation of mitigation measure CUM-N&V-MM#1, the construction-related contribution of the Preferred Alternative north of 7th Standard Road to cumulative noise and vibration impacts would remain cumulatively considerable. Additionally, during operations, even with implementation of mitigation measures for noise and vibration, cumulative effects of operational noise would remain cumulatively considerable.

The Authority finds that noise and vibration mitigation measures, including Mitigation Measure CUM-N&V-MM#1, have been required in the project and that implementation of these mitigation measures would reduce, but not completely avoid or substantially lessen the project's contribution to cumulatively considerable construction noise and vibration impacts. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce these impacts to less-than-cumulatively-considerable levels. To the extent that these cumulatively considerable adverse impacts remain significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

4.4 Biological Resources and Wetlands

Cumulative Construction Impacts on Special-Status Plant and Wildlife Species

Construction of the project in combination with other past, present, and reasonably foreseeable projects may result in the loss of special-status plant and wildlife species within the Tulare Basin at temporary construction sites such as laydown and staging areas. Future projects within this region that are expected to contribute to the cumulative impacts associated with construction of the HST project include, but are not limited to, the Corcoran Irrigation District Solar Project and Generation Facilities, and the Smyrna and Goose Lake Solar Developments. Additionally, the construction of the adjacent HST sections, Merced to Fresno to the north, and Bakersfield to Palmdale to the south, would contribute to the net loss of special-status plant and wildlife species. These projects, including the Preferred Alternative north of 7th Standard Road, are located in areas containing similar habitat requirements for special-status plants and wildlife species; in particular they are located in areas of vernal pool swales and desert washes which provide suitable habitat for vernal pool fairy shrimp, vernal pool tadpole shrimp, western burrowing owl, coast horned lizard, heartscale, alkali goldfields, and spinescale scrub, which are known to occur in the area. Other special-status plant species such as little mouse tail, and other special-status wildlife species such as valley elderberry longhorn beetle, western spadefoot toad, blunt-nosed leopard lizard, Swainson's hawk, Tipton kangaroo rat, and San Joaquin kit fox have potential to occur in the construction footprint of the HST project and the footprints of other cumulative projects. Impacts could include the temporary loss of wetlands, hydrological changes to wetlands, and loss of habitat for special-status species. Construction activities may result in the "take" of individuals in the form of mortality, injury, or harassment due to trampling, noise, dust, motion disturbance, or temporary destruction and degradation of suitable habitat. These impacts are considered cumulatively significant.

However, with implementation of the mitigation measures set for biological resources forth in Section 3.5 of these Findings, the project's incremental contribution to this cumulatively significant impact would not be cumulatively considerable. The Authority therefore finds that mitigation measures have been incorporated in the project that will reduce the project's contribution to cumulatively considerable construction impacts to special-status plant and wildlife species to less-than-cumulatively-considerable levels.

Cumulative Construction Impacts on Habitats of Concern

Construction of the project in combination with other past, present, and foreseeable projects may result in the temporary destruction or degradation of special-status plant communities; impede implementation of recovery plans; temporarily place fill or increase erosion, siltation, and runoff in jurisdictional waters (i.e., seasonal wetlands, vernal pools); and remove or modify protected trees (i.e., native oaks). Cumulative impacts to jurisdictional wetlands and waters may be caused by the combined construction of numerous transportation and development projects. These projects include, but are not limited to, the Fresno Freight Rail Alignment Project in Fresno County which crosses the Kings River, Murphy Slough, and several unnamed canals and ditches, the Goose Lake Solar Project and the Smyrna Solar Project. Additionally, construction of the adjacent HST sections, Merced to Fresno to the north, and Bakersfield to Palmdale to the south, would contribute to the net loss of wetlands and other habitats of concern in the cumulative study area. Cumulative impacts to recovery plans, such as the Recovery Plan for Upland Species of the San Joaquin Valley, California, as well as the additional removal of protected trees as a result of past, present, and foreseeable projects, including those listed above, would be cumulatively significant. Impacts to jurisdictional waters and recovery plans would be cumulatively significant.

However, with implementation of the mitigation measures for biological resources set forth in Section 3.5 of these Findings, the project's incremental contribution to this cumulatively significant impact would not be cumulatively considerable. The Authority therefore finds that mitigation measures have been incorporated in the project that will reduce the project's cumulatively considerable construction impact to habitats of concern to less-than-cumulatively-considerable levels.

Cumulative Operational Impacts on Special-Status Plant and Wildlife Species

Potential impacts on special-status species from operation of the project and other past, present, and foreseeable projects include permanent habitat loss, habitat fragmentation, introduction of invasive species, and harassment due to increased noise and human disturbance. Planned and potential development projects and transportation projects, including, but not limited to, the Smyrna and Goose Lake Solar Developments, would contribute to significant impacts on special-status species because these projects together with the HST project, could impact habitat with potential for special-status plant and wildlife species presence. Additionally, the adjacent HST sections, Merced to Fresno to the north and Bakersfield to Palmdale to the south, would contribute to the net loss of special-status plant and wildlife species. Cumulative operations impacts on special-status plant and wildlife species would be significant. Because of the large area that would be permanently occupied by HST facilities, impacts to special-status plant and wildlife species would be substantial as a result of permanent habitat conversion and loss. Mitigation measures for the HST project include preconstruction surveys, avoidance, habitat restoration, and offsite habitat preservation, enhancement and compensation, which would reduce the project's contribution to this impact. In the context of the loss of special-status plant and wildlife species from past, present, and reasonably foreseeable agricultural and urban development in the Tulare Basin, the contribution of the HST project to these significant cumulative impacts would be cumulatively considerable before mitigation.

However, mitigation for the project includes restoration, enhancement, and preservation of jurisdictional waters and riparian habitats to the extent that there will be no net loss of aquatic resources, functions, and services. These habitats are important for many special-status plant and wildlife species. In addition, project mitigation includes preservation of habitat occupied by special-status plant and wildlife species. This preservation in combination with restoration, enhancement, and preservation of jurisdictional waters will improve biological resources in the region over existing conditions. For these reasons, with implementation of the mitigation

measures for biological resources set forth in Section 3.5 of these Findings, the project's incremental contribution to this cumulatively significant impact to special-status plant and wildlife species will not be cumulatively considerable. The Authority therefore finds that mitigation measures have been incorporated in the project that will reduce the project's contribution to cumulatively considerable operational impacts to special-status plant and wildlife species to less-than-cumulatively-considerable levels.

Cumulative Operational Impacts on Habitats of Concern

Several projects planned within the Tulare Basin in combination with the HST project would have cumulative impacts on habitats of concern prior to mitigation. These projects include, but are not limited to: Goose Lake Solar, Smyrna Solar, Kettleman Photovoltaic Solar Farm Project, and Avenal Park Photovoltaic Solar Farm. Additionally, the adjoining HST sections, Merced to Fresno to the north and Bakersfield to Palmdale to the south, would contribute to the net loss of wetlands and other habitats of concern in the basin. Operational impacts of these projects in association with the HST project could include permanent fragmentation, degradation, or conversion of habitats of concern including jurisdictional waters, as well as loss of wetlands, and hydrological changes to wetlands, loss of special-status plant communities, loss of recovery plan areas and the removal or modification of protected trees. The operation of the HST project prior to mitigation in combination with other past, present, and foreseeable projects would result in a significant cumulative impact to habitats of concern within the Tulare Basin.

However, mitigation for the project includes restoration, enhancement, and preservation of jurisdictional waters and riparian habitats to the extent that there will be no net loss of aquatic resources, functions, and services. These habitats are important for many special-status plant and wildlife species. In addition, project mitigation includes preservation of habitat occupied by special-status plant and wildlife species. This preservation in combination with restoration, enhancement, and preservation of jurisdictional waters will improve biological resources in the region over existing conditions. For these reasons, with implementation of the mitigation measures for biological resources set forth in Section 3.5 of these Findings, the incremental contribution of the project to this cumulative impact to habitats of concern will not be cumulatively considerable. The Authority therefore finds that mitigation measures have been incorporated in the project that will reduce the project's contribution to cumulatively considerable operational impacts to habitats of concern to less-than-cumulatively-considerable levels.

Cumulative Operational Impacts on Wildlife Movement Corridors

Past projects have significantly degraded the ability of wildlife to freely move across natural habitats, and wildlife movement would be further limited with the Preferred Alternative north of 7th Standard Road and other past, present, and reasonably foreseeable projects in the Tulare Basin. Planned and potential projects which could reduce the ability of wildlife to move freely across natural habitats include, but are not limited to, the Fresno Freight Rail Alignment Project, which extends through Fresno County, and the 7th Standard Road widening in Bakersfield. Additionally, the adjacent HST sections, Merced to Fresno to the north and Bakersfield to Palmdale to the south would contribute to blockage of wildlife movement corridors. Impacts from these projects could include the permanent blockage of corridors and/or linkages and disruption of wildlife due to increased lighting, noise, and motion. These cumulative impacts would be significant. Because the project is linear, spanning much of the southern San Joaquin Valley, its impact on wildlife movement corridors would be cumulatively considerable before mitigation.

However, mitigation measures for the project includes extensive installation of wildlife crossings in areas of wildlife mitigation corridors where the HST alignment is at grade and preservation of habitat occupied by special-status plant and wildlife species, much of which is located within wildlife movement corridors. For these reasons, with implementation of the mitigation measures

for biological resources set forth in Section 3.5 of these Findings, the incremental contribution of the HST project to cumulative impacts would be not be cumulatively considerable. The Authority therefore finds that mitigation measures have been incorporated in the project that will reduce the project's contribution to cumulatively considerable operational impacts to on wildlife movement corridors to less-than-cumulatively-considerable levels.

4.5 Socioeconomics and Communities

Cumulative Construction Impacts Contributing to Division of Communities

Construction of projects under the cumulative condition in the vicinity of the Preferred Alternative north of 7th Standard Road would contribute to cumulative impacts associated with the division and/or disruption of communities in the cities of Fresno, Hanford, Wasco, and Shafter, and, as well as unincorporated communities in Kings and Kern counties. In Fresno, the widening of Ventura Boulevard, the construction of a 3-million-gallon water storage tank, and the reconstruction of the SR 99 Monterey Bridge are all planned within 1 mile of each other in the Central and Edison districts of Fresno. Construction of the projects themselves would not displace any residents or impact the community's character. However, there could be temporary increases in traffic, changes in traffic patterns and access to community facilities, and construction noise and dust if the projects were constructed simultaneously with the Preferred Alternative north of 7th Standard Road. In addition, division and/or disruption of communities could result from construction of the HST project and other cumulative projects such as: reconstruction and widening of roads, including Excelsior Avenue, 13th Avenue, SR 198, 10th Avenue, and 10½ Avenue in and around Hanford, construction of the BNSF Railway double tracking and roadway improvements and widening, including Palm Avenue, Poso Drive, Beech Street, Mannel Avenue, Lerdo Highway, and 7th Standard Road and in the cities of Wasco, Shafter, and unincorporated communities nearby such as Crome. Construction activities associated with these projects could hinder access and interaction among neighborhoods because of increased congestion, detours, and lane or road closures. Construction of the Preferred Alternative north of 7th Standard Road, which may coincide with construction of the projects described above, would result in a significant cumulative impact. The incremental contribution of the Preferred Alternative north of 7th Standard Road to this cumulative impact would be cumulatively considerable.

With implementation of mitigation measures for Socioeconomics, Communities, and Environmental Justice described in Section 3.8 of these Findings, impacts would be reduced, but not to less-than-significant levels.

In addition, the following mitigation measure would be implemented.

CUM-SO-MM#1: Consult with agencies regarding construction activities. To minimize the potential cumulative effects of overlapping construction activities within the same area, the Authority would consult with the local city and county planning departments and other agencies as determined necessary, to notify the departments/agencies regarding the anticipated HST construction schedule and allow for adjustment of construction schedules for adjacent projects or projects in close proximity to the HST alignment, to the extent feasible, in order to limit the overlap of community disruption.

With implementation of the above mitigation measure, the cumulative division and/or disruption of communities during construction would be somewhat reduced. However, the contribution of the Preferred Alternative north of 7th Standard Road to these impacts would remain cumulatively considerable.

The Authority finds that mitigation measures, including Mitigation Measure CUM-SO-MM#1, have been required in the project and that implementation of these mitigation measures would reduce,

but not completely avoid or substantially lessen the project's contribution to the construction impacts associated with the division and/or disruption of communities. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this incremental contribution to a less-than-cumulatively-considerable level. To the extent that this cumulatively considerable adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

Cumulative Operational Socioeconomic and Communities Impacts

Under the cumulative scenario, several communities could experience division and/or disruption. On the east side of Hanford, the reconstruction and widening of roads including Excelsior Avenue, SR-198, 10th Avenue, and 10 ½ Avenue could result in division of existing communities. The HST project would also contribute to division of rural communities east of Hanford, and in Crome between Shafter and Bakersfield. Therefore, the cumulative impacts to division of communities would be significant. Even with implementation of the mitigation measures adopted for the project's Socioeconomic and Communities impacts, which are set forth in Section 3.8 of these Findings, the contribution of the project to this cumulative impact would be cumulatively considerable.

The Authority finds that socioeconomic and communities mitigation measures have been required in the project and that implementation of these mitigation measures would reduce, but not completely avoid or substantially lessen the project's cumulatively considerable operational impact associated with the division and/or disruption of communities. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-cumulatively-considerable level. To the extent that this cumulatively considerable adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

4.6 Station Planning, Land Use, and Development

Although future development under the cumulative condition would generally be implemented in compliance with local zoning and land use plans, several proposed or planned projects, including, but not limited to, the HST project and the Merced to Fresno section of the HST, could result in significant cumulative land use changes compared to the existing intensity of land uses as well as new uses incompatible with adjacent land uses. Therefore, the cumulative land use impacts would be cumulatively significant.

The HST project would result in the permanent conversion of land to transportation uses, which in many locations would be incompatible with existing land uses. Although the amount of land affected by the conversion of uses under the HST project would be a relatively small percent of the four-county study area, there is the potential for significant land use incompatibilities to occur. To reduce operation impacts, the Authority has considered avoidance and minimization measures that are consistent with commitments in the Program EIR/EIS documents. In addition, the Authority has adopted the mitigation measures for the project's station planning, land use, and development impacts, as described in Section 3.9 of these Findings. No additional measures are available to minimize or avoid significant land use impacts. The Authority will work with local governments to amend their plans to reduce the land use conflicts where appropriate. Even with these measures, the contribution of the Preferred Alternative north of 7th Standard Road to cumulative land use impacts would remain cumulatively considerable.

The Authority finds that station planning, land use, and development mitigation measures have been required in the project and that implementation of these mitigation measures would reduce,

but not completely avoid or substantially lessen the project's cumulatively considerable operational station planning, land use, and development impact. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-cumulatively-considerable level. To the extent that this cumulatively considerable adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

4.7 Agricultural Lands

Development of other past, present, and reasonably foreseeable projects, including, but not limited to, the Rockwell Pond Commercial Project in Fresno, the Live Oak Residential Project in Hanford, and the South I Street Industrial Park Specific Plan in Tulare, would result in the conversion of Important Farmland to non-agricultural uses. In addition, the HST project would require the acquisition of Important Farmland. The conversion of Important Farmland to non-agricultural uses resulting from the HST project and other past, present, and foreseeable projects would be a significant cumulative impact.

With implementation of the agricultural mitigation measure described in Section 3.10 of these Findings, impacts would be reduced through the purchase of agricultural conservation easements from willing sellers. However, because Important Farmland is irreplaceable, the contribution of the Preferred Alternative north of 7th Standard Road during project operations to cumulative agricultural impacts would remain cumulatively considerable.

The Authority finds that agricultural mitigation has been required in the project and that implementation of this mitigation measure would reduce, but not completely avoid or substantially lessen the project's contribution to the cumulatively considerable operational agricultural impact. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-cumulatively-considerable level. To the extent that this cumulatively considerable adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

4.8 Aesthetics and Visual Resources

Cumulative Construction Impacts on Aesthetics and Visual Resources

Development of cumulative projects, including oil and gas wells (e.g., Vintage Production California Oil and Gas Wells, California Department of Oil, Gas and Geothermal development Oil and Gas Well Development), solar power generation plants (e.g., the Kettleman Photovoltaic Solar Farm Project), roadway and highway improvement projects (e.g., SR 198 improvements), and residential and commercial developments (e.g., Highway 43/198 Commercial center project) in the vicinity of the HST project, would result in construction activities that would create temporary visual changes from demolition, vegetation removal, establishment of construction staging areas, and construction lighting. Even though construction activities would be temporary, due to the scale and proximity of cumulative projects listed in Appendix 3.19-A and 3.19-B of the Final EIR/EIS, including the adjacent HST sections (the Merced to Fresno and Bakersfield to Palmdale sections), the combined impacts of the cumulative projects could be significant and could overlap with construction of the Preferred Alternative north of 7th Standard Road in certain views. These construction-related cumulative impacts to visual resources could be cumulatively considerable.

Construction of the Preferred Alternative north of 7th Standard Road and other cumulative projects would also create temporary visual changes from demolition, vegetation removal, construction staging areas, construction lighting, and general construction activities. The HST project would noticeably affect the Fresno downtown area during construction. Where the cumulative projects and the Preferred Alternative north of 7th Standard Road have overlapping construction schedules and are located in close proximity, construction could result in significant cumulative visual impacts.

Implementation of the aesthetics and visual resource mitigation measure described in Section 4.9 of these findings would reduce the incremental contribution of the Preferred Alternative north of 7th Standard Road to these significant cumulative construction impacts to less-than-cumulatively-considerable levels. Because the Preferred Alternative north of 7th Standard Road does not include an alignment or station in Bakersfield, there would be no cumulatively considerable construction or operational impacts on aesthetic and visual resources that are significant and unavoidable.

The Authority finds that mitigation measures for construction impacts to aesthetic and visual resources have been required in the project and that implementation of these mitigation measures would reduce the project's cumulatively considerable construction impact on aesthetic and visual resources to less-than-cumulatively-considerable levels.

4.9 Cultural and Paleontological Resources

Under the cumulative condition, cultural resources would continue to be affected in the San Joaquin Valley urbanizing areas due to growth, changes in land use, and other types of ground disturbance. Development in the urban areas would likely result in further unearthing of sensitive archaeological resources, disturbance of traditional cultural properties, disturbance and possible damage to paleontological resources, and removal of—or changes to—the historic character and settings of historic resources. Prehistoric and historic archaeological sites would be affected during project construction activities. Prehistoric sites are common in riverbank and floodplain areas, and burial sites are sometimes encountered during ground-disturbing activities. It is likely that known and unknown archaeological resources could be disturbed and cultural resources damaged or destroyed during construction activities associated with the Preferred Alternative north of 7th Standard Road and other past, present, and reasonably foreseeable projects. Linear projects that require extensive excavation, such as the Merced to Fresno and Bakersfield to Palmdale sections of the HST, the Central Valley Independent Network Fiber Optic Communications Network Project, the Cawelo S5 Lateral to Conduit F Interconnection Pipeline, and the Caltrans SR-46 project have the potential to cause substantial adverse change to archaeological resources. Significant and unavoidable losses of unique archaeological resources (as defined in Public Resources Code Section 21083.2) or a historical resource (as defined in Section 21083.2 of CEQA and Section 15064.5 of the CEQA Guidelines) could occur if excavation exposes archaeological deposits that cannot be effectively removed or recovered due to the circumstances of their exposure (e.g., in railroad rights-of-way or urbanized settings) or if recovery would not be sufficient to prevent the loss of significant cultural resources.

Historical architectural resources could also be damaged or require removal due to implementation of the projects under the cumulative condition. Local projects and the secondary effects of redevelopment pressures around the HST stations would potentially result in the removal of historical buildings in downtown Fresno. Adverse effects on eligible resources could result in the neglect, abandonment, or removal of historic properties, by such projects as the Merced-Fresno and Bakersfield to Palmdale HST sections. Other projects could also have similar impacts on the existing built environment as the HST. If these resources meet the definition of a historical resource or a historic resource (as defined in Section 106, 36 CFR 800), their modification or destruction would be significant. The Preferred Alternative north of 7th Standard

Road could result in significant, unavoidable impacts on historic resources, as described in Section 3.17, Cultural and Paleontological Resources of the Final EIR/EIS. Therefore, construction of the HST in conjunction with past, present, and reasonably foreseeable projects under the cumulative condition could result in significant cumulative impacts to historical architectural resources.

The Preferred Alternative north of 7th Standard Road would minimize cumulative impacts on cultural resources by adhering to federal and state regulations and by providing guidance on the treatment of significant properties (as defined in the PA). Implementation of the mitigation measures for cultural resources described in Section 3.13 of these Findings such as monitoring during construction, avoidance, compliance with applicable regulations, worker training, relocation of resources, and preparation of applicable documentation would minimize impacts. However, even with implementation of these mitigation measures, the contribution of the Preferred Alternative north of 7th Standard Road to cumulative impacts would remain cumulatively considerable. The Authority finds that cultural and paleontological mitigation measures have been required in the project and that implementation of these mitigation measures would reduce, but not completely avoid or substantially lessen the project's cumulatively considerable construction impact on cultural and paleontological resources. The Authority finds that there are no other feasible mitigation measures or alternatives that would reduce this impact to a less-than-cumulatively-considerable level. To the extent that this cumulatively considerable adverse impact remains significant and unavoidable, the Authority finds that specific economic, social, and other considerations identified in the Statement of Overriding Considerations support certification of the EIR/EIS and approval of the project.

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5.0 Feasibility of Potential Alternatives

CEQA requires the lead agency, the High-Speed Rail Authority, to consider a reasonable range of potentially feasible alternatives to the proposed project (Public Resources Code, §§ 21002, 21081; see also CEQA Guidelines, § 15126.6). "Feasible" means capable of being accomplished in a successful manner within a reasonable time, taking into account economic, environmental, legal, social and technological factors (CEQA Guidelines, § 15364). The range of alternatives to be considered is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project (CEQA Guidelines, § 15126.6(f)). At the same time, an EIR need not study in detail an alternative that a lead agency "has reasonably determined cannot achieve the project's underlying fundamental purpose" (*In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143, 1165).

As discussed above, prior to moving forward with the project, CEQA requires that the lead agency find that "specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the project alternatives identified in the environmental impact report" (Public Resources Code, § 21081). The determination of infeasibility "involves a balancing of various 'economic, environmental, social, and technological factors'" (*City of Del Mar v. City of San Diego* (1982) 133 Cal.App.3d 401, 417). Where there are competing and conflicting interests to be resolved, the determination of infeasibility "is not a case of straightforward questions of legal or economic feasibility," but rather, based on policy considerations (*California Native Plant Society v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 1001-02). "[A]n alternative that is 'impractical or undesirable from a policy standpoint' may be rejected as infeasible" (Id. at p. 1002 citing 2 Kostka & Zischke, Practice Under the Cal. Environmental Quality Act, (Cont.Ed.Bar 2010) section 17.29, p. 824).

The key policy considerations that must be balanced in determining the feasibility of the project alternatives include the following:

- The Authority's statutory responsibility, which is to:

"direct the development and implementation of intercity high-speed rail service that is fully integrated with the state's existing intercity rail and bus network, consisting of interlinked conventional and high-speed rail lines and associated feeder buses. The intercity network in turn shall be fully coordinated and connected with commuter rail lines and urban rail transit lines developed by local agencies, as well as other transit services, through the use of common station facilities whenever possible" (Public Utilities Code, § 185030).
- The purpose of the statewide HST System, which is to provide a reliable high-speed electrified train system that links the major metropolitan areas of the state, and that delivers predictable and consistent travel times. A further objective is to provide an interface with commercial airports, mass transit and the highway network and relieve capacity constraints of the existing transportation system as increases in intercity travel demand in California occur, in a manner sensitive to and protective of California's unique natural resources (Final EIR/EIS, page 1-5).
- The Authority's prior determination that serving intermediate markets in the Central Valley, rather than bypassing them, is an important component of the high-speed train system.

- The purpose of the Fresno to Bakersfield Section, which is to implement the Fresno to Bakersfield Section of the California HST System to provide the public with electric-powered high-speed rail service that provides predictable and consistent travel times between major urban centers and connectivity to airports, mass transit, and the highway network in the south San Joaquin Valley, and connect the northern and southern portions of the system (Final EIR/EIS, p. 1-6).
- The Authority's objectives, which are:
 - Provide intercity travel capacity to supplement critically over-used interstate highways and commercial airports.
 - Meet future intercity travel demand that will be unmet by current transportation systems, and increase capacity for intercity mobility.
 - Maximize intermodal transportation opportunities by locating stations to connect with local transit, airports, and highways.
 - Improve the intercity travel experience for Californians by providing comfortable, safe, frequent, and reliable high-speed travel.
 - Provide a sustainable reduction in travel time between major urban centers.
 - Increase the efficiency of the intercity transportation system.
 - Maximize the use of existing transportation corridors and rights-of-way, to the extent feasible.
 - Develop a practical and economically viable transportation system that can be implemented in phases by 2020 and generate revenues in excess of operations and maintenance costs.
 - Provide intercity travel in a manner sensitive to and protective of the region's natural and agricultural resources and reduce emissions and vehicle miles traveled for intercity trips.
- The characteristics enumerated in Streets and Highways Code section 2704.09 for the statewide high-speed train system as a whole, which include:
 - 2704.09(a) – Electric trains that are capable of sustained maximum revenue operating speeds of no less than 200 miles per hour
 - 2704.09(b) - Maximum nonstop service travel times for each corridor that shall not exceed the following:
 - (1) San Francisco-Los Angeles Union Station: two hours, 40 minutes.
 - (2) Oakland-Los Angeles Union Station: two hours, 40 minutes.
 - (3) San Francisco-San Jose: 30 minutes.
 - (4) San Jose-Los Angeles: two hours, 10 minutes.
 - (5) San Diego-Los Angeles: one hour, 20 minutes.
 - (6) Inland Empire-Los Angeles: 30 minutes.
 - (7) Sacramento-Los Angeles: two hours, 20 minutes.
 - 2704.09(c) - Achievable operating headway (time between successive trains) shall be five minutes or less.
 - 2704.9(d) - The total number of stations to be served by high-speed trains for all of the corridors described in subdivision (b) of Section 2704.04 shall not exceed 24. There shall be no station between the Gilroy station and the Merced station.

- 2704.09(e) - Trains shall have the capability to transition intermediate stations, or to bypass those stations, at mainline operating speeds.
- 2704.09(f) - For each corridor described in subdivision (b), passengers shall have the capability of traveling from any station on that corridor to any other station on that corridor without being required to change trains.
- 2704.09(g) - In order to reduce impacts on communities and the environment, the alignment for the high-speed train system shall follow existing transportation or utility corridors to the extent feasible and shall be financially viable, as determined by the authority.
- 2704.09(h) - Stations shall be located in areas with good access to local mass transit or other modes of transportation.
- 2704.09(i) - The high-speed train system shall be planned and constructed in a manner that minimizes urban sprawl and impacts on the natural environment.
- 2704.09(j) - Preserving wildlife corridors and mitigating impacts to wildlife movement, where feasible as determined by the authority, in order to limit the extent to which the system may present an additional barrier to wildlife's natural movement.
- The ability of an alternative to comply with Clean Water Act section 404 by qualifying as the "least environmentally damaging practicable alternative" (LEDPA) in terms of adverse effects on waters of the United States and jurisdictional wetlands (Clean Water Act, section 404(b)(1)). Alternatives other than the LEDPA would not receive the federal Section 404 permit that is necessary for construction. The USACE and EPA concurred that the Preferred Alternative is the preliminary LEDPA (letters from USACE March 26, 2012 and U.S. EPA March 23, 2012).
- Complexity of construction – Generally, construction is more complex within urban areas than in rural areas due to the necessity to minimize impacts on neighboring residences and businesses that are substantially more numerous in urban areas and the greater potential for conflicts with public utilities and infrastructure (i.e., sewer and water lines, local streets) in urban areas.
- The inherent tradeoffs in terms of environmental impacts that occur between (1) following existing transportation corridors, minimizing impacts on the biological resources, and agricultural lands and communities, but increasing impacts on urban communities and the urban environment and (2) departing from existing transportation corridors, minimizing impacts on urban communities and the urban environment, but increasing impacts on biological resources, agricultural lands, and agricultural communities.

As discussed above in Section 2.1.2, this decision involves the Preferred Alternative north of 7th Standard Road in Kern County only. The Authority is reserving a decision on an alignment/station south of 7th Standard Road and a decision on an HMF location to a future time. The following discussion is therefore focused on the scope of the project approval at hand.

5.1 Alternatives Considered in the Project EIR/EIS and Not Selected for Approval

The Final EIR/EIS included the BNSF Alternative, which extends from the northern end of the Fresno station tracks to Oswell Street in Bakersfield, and ten alignment alternatives. The BNSF Alternative most closely follows the Authority's corridor selection decision at the conclusion of the

Statewide Program EIR/EIS process in 2005. In addition to the alignment alternatives, the EIR/EIS included HST station location and heavy maintenance facility (HMF): two station location alternatives in Fresno, two station location alternatives in the Hanford area, three station location alternatives in Bakersfield, and five HMF location alternatives. The required No-Project Alternative has also been analyzed in the EIR/EIS. These alternatives are described in detail in Chapter 2 of the EIR/EIS.

The alignment, station location, and HMF location alternatives analyzed in the EIR/EIS were all determined to be potentially feasible by the Authority and to merit study in the EIR/EIS. In these findings, the High-Speed Rail Authority Board is making the final determination of actual feasibility for alternatives that it will not select (*California Native Plant Society v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 981). The determination of final feasibility is a necessary preliminary step before the Authority's adoption of its statement of overriding considerations (*City of Marina v. Board of Trustees of California State University* (2006) 39 Cal.4th 341). The Final EIR/EIS is the basis for the following discussion, except where reference is made to the LEDPA or to specific statutes and plans.

5.1.1 The No Project Alternative

The **No Project Alternative** would result in no construction and operation of the HST System as a whole, or in the Fresno to Bakersfield section. This is the case because the Fresno to Bakersfield section is an essential component of the system in connecting the northern and southern portions of the state. The No Project Alternative is contrary to the Authority's 2005 programmatic decision to choose the HST System to meet the state's transportation demands instead of expanding airports or freeways, or doing nothing, and contrary to the Authority's Business Plans as submitted to the Legislature in 2012 and 2014. As a result, the No Project Alternative would not meet any of the project objectives, would not meet the project's underlying fundamental purpose, and would not allow the Authority to comply with its statutory mandate to "prepare a plan for the construction and operation of a high-speed train network for the state" (Public Utilities Code, § 185032) and of Proposition 1A (Streets and Highways Code Section 2704, et seq.) to develop an HST project. The Authority therefore finds the No Project Alternative is infeasible and rejects it on that basis.

5.1.2 Hanford Area Alternatives

The **Hanford West Bypass 1 (at-grade and below-grade) Alternative** diverges from the BNSF corridor just south of East Elkhorn Avenue. This alternative has an at-grade and a below-grade design options. The Hanford West Bypass 1 Alternative, at-grade and below-grade options would each result in four permanent road closures, affecting circulation patterns. The Hanford West Bypass 1 Alternative options would displace seven businesses and induce commercial business displacement costs. In addition, the Hanford West Bypass 1 Alternative at-grade option would displace 53 total residential units and the Hanford West Bypass 1 Alternative below-grade option would displace 52 total residential units. The Hanford West Bypass 1 Alternative options would result in indirect impacts to wetlands and the at-grade option would result in the greatest acreage of direct permanent impacts on waters of the U.S. of the Hanford Area alternatives. The Hanford West Bypass 1 (both at-grade and below-grade options) would result in the use of two Section 4(f) properties: Last Chance Ditch and 11029 Kent Avenue. The Hanford West Bypass 1 Alternative, at-grade and below-grade options, would permanently affect 842 acres of agricultural land, including potential conversion from parcel severance. This alternative does not qualify as part of the preliminary LEDPA for the HST Fresno to Bakersfield section (refer to the USACE's "Checkpoint C" determination).

The **Hanford West Bypass 2 (at-grade) Alternative** is the same as the Hanford West Bypass 1 Alternative from East Kamm Avenue to just north of Jackson Avenue. At that point, the Hanford

West Bypass 2 Alternative curves away from the Hanford West Bypass 1 Alternative to travel to the east at the intersection of Kent and Eleventh avenues toward the BNSF corridor. This alternative has an at-grade and a below-grade design option; however, this discussion will only reflect information regarding the at-grade option. The Hanford West Bypass 2 Alternative (at-grade option) would result in four permanent road closures, affecting circulation patterns. The Hanford West Bypass 2 Alternative (at-grade option) would displace seven businesses and induce commercial business displacement costs. The Hanford West Bypass 2 Alternative would displace 52 total residential units. This alternative would result in indirect impacts to wetlands and the greatest acreage of indirect impacts on waters of the U.S. of the Hanford Area alternatives. The Hanford West Bypass 2 Alternative (at-grade option) would result in a use of one Section 4(f) property: Last Chance Ditch and would permanently affect 798 acres of agricultural land, including potential conversion from parcel severance. This alternative does not qualify as part of the preliminary LEDPA for the HST Fresno to Bakersfield section (refer to the USACE's "Checkpoint C" determination).

The Hanford West Bypass alternatives would result in the conversion of fewer acres of agricultural lands to nonagricultural uses and fewer impacts to Williamson Act lands than the BNSF Alternative in this area, but because they would pass close to the communities of Grangeville and Armona, slightly more housing and business displacements and a larger number of sensitive noise receivers would be significantly impacted under these alternatives than under the BNSF Alternative. Also, these alternatives would affect a larger number of historically significant cultural resources than the BNSF Alternative. Because this alternatives would travel west of Hanford, they would provide a comparatively less effective regional station location due to being farther away from and less accessible to Tulare and Visalia. Balancing environmental impact, project purpose, long-term planning, and policy considerations, the Authority finds that the Hanford West Bypass alternatives are not environmentally superior but offer environmental impact tradeoffs to the Preferred Alternative in the Hanford area, are not part of the preliminary LEDPA for Clean Water Act section 404 purposes, and provide a less desirable location for a regional HST station than the Preferred Alternative. For these reasons, the Authority finds the Hanford West Bypass alternatives to not offer a substantial environmental advantage and to also be infeasible and rejects them for these reasons.

5.1.3 Corcoran Area Alternatives

The **BNSF (through Corcoran) Alternative** (referred to as the BNSF Corcoran Alternative) follows the BNSF right-of-way on its western side through the community of Corcoran and travels through the eastern edge of the city. The BNSF Corcoran Alternative would have the greatest displacement costs of the Corcoran area alternatives, 16 businesses, and an estimated 52 housing units. The BNSF Corcoran Alternative would also have disproportionately high and adverse noise and visual resource effects on an environmental justice community. The BNSF Corcoran Alternative would result in two permanent road closures, affecting circulation patterns. This alternative would result in impacts to wetlands and the greatest acreage of direct permanent impacts to waters of the U.S. of the Corcoran Area alternatives. The BNSF Corcoran Alternative would affect 261 acres of Important Farmland. This alternative does not qualify as the LEDPA for the HST Fresno to Bakersfield section (refer to the USACE's "Checkpoint C" determination).

The **Corcoran Elevated Alternative** is the same as the corresponding section of the BNSF Alternative from approximately Nevada Avenue to Avenue 136, except that it passes through Corcoran on the eastern side of the BNSF right-of-way on an aerial structure. The Corcoran Elevated Alternative would displace one business and three housing units. The Corcoran Elevated Alternative would also have disproportionately high and adverse noise and visual resource effects on an environmental justice community. The Corcoran Elevated Alternative would result in one permanent road closure, affecting circulation patterns. This alternative would result in impacts to wetlands and the greatest acreage of indirect impacts to waters of the U.S. of the Corcoran area

alternatives. The Corcoran Elevated Alternative would permanently affect 106 acres of Important Farmland. This alternative does not qualify as part of the preliminary LEDPA for the HST Fresno to Bakersfield section (refer to the USACE's "Checkpoint C" determination).

Balancing environmental impact and policy considerations, the Authority finds that the BNSF (through Corcoran) Alternative and the Corcoran Elevated Alternative are not environmentally superior to the Preferred Alternative in the Corcoran area (Corcoran Bypass), but offer environmental impact tradeoffs. The Authority further finds that these Corcoran area alternatives are not part of the preliminary LEDPA for Clean Water Act section 404 purposes. For these reasons, the Authority finds the BNSF (through Corcoran) Alternative and the Corcoran Elevated Alternative do not offer a substantial environmental advantage and are infeasible and rejects them for these reasons.

5.1.4 Allensworth Area Alternatives

The **BNSF (through Allensworth) Alternative** (referred to as the BNSF Allensworth Alternative) follows the BNSF corridor and passes through both the Allensworth Ecological Reserve and the Colonel Allensworth State Historic Park (Section 4[f] properties). This alternative continues to follow the BNSF corridor until it elevates over the Tule River, Deer Creek, and the Stoil railroad spur from the BNSF corridor. The BNSF Allensworth Alternative would have greater displacement costs, including the loss of nine housing units, as compared to the Allensworth Bypass. The BNSF Allensworth Alternative would also have a disproportionate effect on parks and recreation for an environmental justice community. This alternative would result in three permanent road closures, affecting circulation patterns. The BNSF Allensworth Alternative would result in greater impacts to wetlands and the greatest acreage of direct permanent, indirect-bisected, and indirect impacts to waters of the U.S. of the Allensworth Area alternatives. The BNSF Allensworth Alternative would affect 468 acres of Important Farmland. This alternative does not qualify as part of the preliminary LEDPA for the HST Fresno to Bakersfield Section (refer to the USACE's "Checkpoint C" determination).

Balancing environmental impact and policy considerations, the Authority finds that this alternative is not environmentally superior to the Preferred Alternative in the Allensworth area (Allensworth Bypass). The Authority further finds that this alternative would result in the acquisition of property from Allensworth State Historic Park and the Allensworth Ecological Reserve, and would cause unacceptable visual and noise effects on the park that are not acceptable from a policy perspective. The Authority further finds that this alternative is not part of the preliminary for Clean Water Act section 404 purposes. For these reasons, the Authority finds the BNSF (through Allensworth) Alternative does not offer a substantial environmental advantage and is infeasible and rejects it for these reasons.

5.1.5 Wasco-Shafter Area Alternatives

The **Wasco-Shafter Bypass** Alternative diverges from the BNSF Alternative between Taussig Avenue and Zachary Avenue, crossing over to the eastern side of the BNSF Railway tracks and bypassing Wasco and Shafter to the east. This alternative is at-grade except where it travels over Seventh Standard Road and the BNSF Railway to rejoin the BNSF Alternative. The Wasco-Shafter Bypass Alternative would result in visual impacts to the rural areas outside Wasco and Shafter. It would include more permanent road closures and would also affect many more historic structures. This alternative would have lower displacement costs for this segment; these costs would include the loss of one religious facility, 2 businesses, and 10 housing units. This alternative would result in lower acreage of direct permanent, direct temporary and indirect impacts to waters of the U.S. of the Wasco-Shafter area alternatives. The project would create long-term noise impacts from the introduction of a new transportation system, including potential vibration impacts, resulting in 61 severely affected receivers, a lower number than the Preferred

Alternative. The Wasco-Shafter Bypass Alternative would permanently affect 573 acres of Important Farmland and permanently convert 304 acres of Williamson Act land. This alternative does not qualify as part of the preliminary LEDPA for the HST Fresno to Bakersfield section (refer to the USACE's "Checkpoint C" determination).

Balancing environmental impact and policy considerations, the Authority finds that this alternative is not environmentally superior to the Preferred Alternative in the Wasco-Shafter area. Natural resource impacts are similar with the Wasco-Shafter Bypass alternative as with the Preferred Alternative (BNSF alternative) in the Wasco-Shafter area. Agricultural land impacts are slightly higher for the BNSF alternative, but agricultural landowners in the area have expressed that the Wasco-Shafter Bypass would cause greater interference to agricultural operations. Community impacts associated with following the BNSF corridor, including residential and business displacements, are greater than for the Wasco-Shafter Bypass alternative, but the impacts can be mitigated. From a policy perspective the Authority acknowledges the strong interest in the City of Shafter in ensuring an alternative that would not interfere with the Paramount Logistics Park, an important inland port. The Authority therefore finds in addition, to not offering a substantial environmental advantage, the Wasco-Shafter Bypass has greater technological, logistical, and cost uncertainty due to it traversing an actively growing oil field and having more active and abandoned oil wells. For these reasons, the Authority rejects this alternative as infeasible.

5.1.6 Station Alternatives

The **Fresno Station–Kern Alternative** was rejected by the Authority in 2012 in favor of the Fresno Station-Mariposa Alternative, for the reasons set forth in the Authority's May 2012 CEQA Findings of Fact attached to resolution # HSRA12-20. The Fresno Station-Mariposa Alternative has formed the basis for the Authority's planning subsequent to May 2012. The Authority rejects the Fresno Station-Kern Alternative on this basis.

The **Kings/Tulare Regional Station–West Alternative** would be located east of 13th Avenue and north of the San Joaquin Valley Railroad on the Hanford West Bypass 1 and 2 alternatives. The station would only be chosen if Hanford West Bypass alignment is chosen. The Preferred Alternative is the BNSF Alternative-Hanford East. Therefore, this station alternative is rejected as it would not serve the BNSF Alternative-Hanford East Alternative.

5.2 Alternatives Suggested by Commenters

Comments on both the Draft EIR/EIS and Revised Draft EIR/Supplemental Draft EIS suggested a number of additional alternatives that the commenters believed merited consideration and analysis in the EIR/EIS. These include the following general proposals:

- Build the HST project completely within/along existing San Joaquin Valley Railroad (SJVR) corridor.
- Build the HST project completely within/along UPRR/SR99 corridor.
- Build the HST project completely within BNSF corridor.
- Build the HST project along the I-5 corridor only.
- Build the HST project along the I-5 corridor alignment with spur connections to Fresno and Bakersfield.
- Build the HST project all underground or on viaduct.
- Improve the existing Amtrak line in order to provide faster service along that line and do not build a HST project.
- Build the HST line around Bakersfield instead of through Bakersfield.

If an EIR contains a reasonable range of alternatives, it is not deficient for excluding analysis of other potential alternatives suggested in comments by members of the public or agencies. The

Authority finds that the EIR/EIS included a reasonable range of alternatives and that the range of alternatives was sufficient to permit a reasoned choice. The Authority therefore finds that no further alternatives were required to be evaluated in the EIR/EIS.

The Authority further finds that the alternatives suggested in comments are not environmentally superior, do not adequately meet the project purpose/objectives, and/or are infeasible for the reasons summarized below, and considering the policy factors discussed above in section 6.0.

Build the HST Project Within/Along Existing Transportation Corridors (SJVR). This suggested alternative is discussed in FB-Response-GENERAL-02 in the Final EIR/EIS, which is hereby incorporated by reference. A HST alignment paralleling the SJVR on the east side of the San Joaquin Valley would not have fewer impacts than the alternatives considered in the environmental document. An alignment that paralleled the SJVR from Fresno to Bakersfield was considered in response to public comments. Existing transportation corridors, specifically, the San Joaquin Valley Railroad rail lines, are not designed to accommodate HST service. The SJVR Alternative was compared with the BNSF Alternative using the principal environmental screening parameters that were considered for the initial evaluation of potential alternatives for the Fresno to Bakersfield Section.

The SJVR Alternative may have fewer impacts to special aquatic resources than the BNSF Alternative; however, initial screening indicates that the SJVR Alternative would have greater impacts to farmlands and urban centers than the BNSF Alternative. The SJVR Alternative passes through a region of the San Joaquin Valley that is as intensely cultivated as the area crossed by the BNSF Alternative. Between Fresno and Bakersfield, the BNSF Alternative would cross through the communities of Corcoran, Wasco, and Shafter. The SJVR Alternative would cross through the communities of Reedley, Dinuba, Ivanhoe, Exeter, Lindsay, Shafter, and Richgrove, twice as many as the BNSF Alternative. The SJVR Alternative would be approximately 11 miles longer than the BNSF Alternative and would add about 3 minutes to the travel time between Fresno and Bakersfield. Because the SJVR Alternative is substantially longer than the BNSF Alternative and crosses through more communities, the capital cost for constructing the HST on this alignment is likely to be higher than the construction costs for the BNSF Alternative. Because the overall environmental impacts of the SJVR Alternative are similar to or greater than the BNSF Alternative and the SJVR Alternative would increase travel time and project costs, the SJVR Alternative is not superior to alternatives that were evaluated and was not considered further. The Authority therefore finds that a SJVR alternative is not environmentally superior to the alternatives in the EIR/EIS, offers no substantial environmental advantage, and due to additional alignment length will be both substantially more costly and less effective at meeting the project's fundamental purpose and most project objectives, and rejects it as infeasible for these reasons.

Build the HST Project Within/Along Existing Transportation Corridors (UPRR/SR 99). This suggested alternative is discussed in FB-Response-GENERAL-02 in the Final EIR/EIS, which is hereby incorporated by reference. The SR 99/UPRR corridor was evaluated in the Statewide Program EIR/EIS for the California HST System (Authority and FRA 2005) and was not selected as the preferred corridor for the Fresno to Bakersfield Section. Alternative alignments within the SR 99/UPRR corridor were re-evaluated for the Fresno to Bakersfield Section. That analysis is provided in the Checkpoint B Summary Report (Authority and FRA 2011). The HST alignment in the SR 99/UPRR corridor presents a number of significant logistical conflicts that involve existing infrastructure that makes the alternative not practicable from a Clean Water Act section 404 perspective and not potentially feasible from a CEQA perspective. These conflicts are unique to this alignment, and many of them are interrelated, especially those involving UPRR tracks. HST design and construction to resolve these conflicts would inhibit or even foreclose nearby desired public and private investment and development. These logistical conflicts could also result in litigation that would further delay the project or potentially preclude the placement of the HST in this corridor.

The UPRR has expressed its concerns in writing on several occasions regarding both the issue of public safety (liability risk) and that of access to customers (commercial risk). The UPRR has stated that it believes that construction of project facilities within or near its right-of-way would expose it to a significant and unmanageable increase in financial risk due to the creation of new hazards. It also maintains that the project would result in both displacement of existing customers, and a "walling off" of miles of its right-of-way to potential future customers. Based on these concerns, active opposition by the UPRR would result in (1) adverse impact on project schedule (delay); and (2) adverse impact on project cost. In addition, the SR 99/UPRR alignment alternative would require the reconstruction of four interchanges along SR 99 and the interchange at SR 99 and SR 198. These interchanges are currently constrained by UPRR. Due to the existing constraints on the roadway and interchange configurations, a new design would require exceptions to the Caltrans design standards. These design exceptions would decrease the safety of the driving public by exposing them to features below the current state highway design standards. The constraints that the existing corridors place on high-speed operations make remaining totally within those corridors infeasible; therefore, these alternatives were not evaluated further.

The Authority therefore finds that an UPRR/SR99 alternative has substantial technological, logistical, legal, economic, and policy problems and rejects it as infeasible for these reasons.

Build the HST Along the I-5 Corridor Only. This suggested alternative was previously considered and rejected for further study in decisions by the Authority and the FRA on the 2005 Final Statewide Program EIR/EIS, as explained in Section 2.3.2 and FB-Response-GENERAL-02 of the Final EIR/EIS, which are hereby incorporated by reference. As described in the Final EIR/EIS and in the various documents supporting the EIR/EIS, operating the HST along the I-5 corridor would not meet the critical objective of maximizing intermodal transportation opportunities because there are no intermodal opportunities, such as transit and airport connections, along the lightly populated I-5 corridor. This suggested alternative would also conflict with Streets and Highways Code Section 2704.09(h) which provides that "stations shall be located in areas with good access to local mass transit or other modes of transportation." In addition, because the corridor is lightly populated, the installation of stations there would necessarily be growth-inducing by stimulating currently unplanned development in the areas around the stations. Also, since the I-5 corridor is not where the bulk of the Central Valley population resides, the I-5 corridor would result in lower ridership and would not meet the current and future intercity travel demand generated by the Central Valley communities as well as the Central Valley corridor. Further, traffic between the existing population centers along SR99 to the stations would stimulate development along the connecting roads. This would conflict with the directive of Streets and Highways Code Section 2704.09(i) and the important policy consideration to minimize urban sprawl.

The lack of population along the I-5 corridor and the comparative population of the I-5 corridor and the BNSF corridor in the Central Valley is equally compelling today as it was in the 2000-2005 Statewide Program EIR/EIS timeframe. The Authority therefore finds that an I-5 corridor alternative is not environmentally superior to the alternatives in the EIR/EIS, offers no substantial environmental advantage, cannot meet the underlying fundamental purpose of the project, or most project objectives, and rejects it as infeasible for these reasons.

Build the HST along the I-5 Corridor with Spur Connections to Fresno and Bakersfield.

Another suggested alternative involves an HST alignment on the I-5 corridor, but with spur tracks to reach the population centers in Fresno and Bakersfield. The concept of linking the I-5 corridor to Fresno and Bakersfield with spur lines was considered at the program level, but dismissed, because it would add considerably to the I-5 corridor capital costs and would still have the same lower ridership figures. Use of the I-5 corridor with spur tracks would also encourage sprawl development, which is the opposite of what the HST System is intended to achieve, and which

was opposed by numerous agencies, including the U.S. Environmental Protection Agency (USEPA). In addition, the use of spur tracks to reach Bakersfield and Fresno would add approximately 24 and 52 miles of track, respectively. To reach the Hanford area would require about 34 miles of spur tracks. The extensive addition of spur tracks would result in many of the same impacts as the Preferred Alternative, including conversion of Important Farmland, impacts to species and habitats, and impacts to communities, the only difference would be the location of the impact. The cost of this alternative, would nearly double the amount of track between Bakersfield and Fresno, would be also be substantially greater. The Authority therefore finds that this suggested alternative is not environmentally superior, does not offer a substantial environmental advantage, would be less capable of meeting the project's underlying fundamental purpose and project objectives than the Preferred Alternative, and would be economically infeasible by requiring nearly double the amount of track as the alternatives studied in the EIR/EIS, and therefore rejects this alternative as infeasible.

Build the HST All Underground or on Viaduct. This suggested alternative would involve vertical profile variations. The HST could theoretically be placed below grade in a cut embankment with 2:1 slopes, a vertical trench with concrete walls, or a tunnel. As described in Chapter 2 of the EIR/EIS, the electrical contact system for the trains would consist of a series of mast poles approximately 23.5 feet higher than the top of the rail. Therefore, the HST would need to be at a depth of about 40 feet for the whole system to be below grade.

A cut embankment through urban areas (or for the entire length of the alignment) was not considered feasible because of the required width of the right-of-way. With 2:1 slopes, a 40-foot deep cut with a bottom width of 120 feet would have a width at the surface of 160 feet. This would result in a substantial increase in the amount of properties that would have to be acquired resulting in greater impacts to communities and landowners crossed by the project. Placing the HST in a trench or tunnel would increase the project costs by more than one to two orders of magnitude, essentially making the project economically infeasible. The costs of constructing an at-grade foundation for HST tracks, a 40-foot-deep trench, and a tunnel were estimated using the unit price analysis method as described in the Engineering Technical Memoranda 1.1.19 and 1.1.22 available on the Authority's website. This method of cost estimating was typically used to develop costs for complex construction elements, including but not limited to viaducts, retained earth systems, tunneling, and underground structures.

Using basic cost data that were input into the database estimating program, the civil construction costs (i.e., the costs of clearing the right-of-way and constructing the embankment for the HST rails and contact system) for an at-grade section of the HST System are estimated to be about \$2.5 million/mile. The civil construction costs for an elevated structure like that proposed for downtown Bakersfield is a maximum of about \$84 million/mile. The civil construction costs for a 40-foot deep trench would be approximately \$121 million/mile for two tracks. The civil construction costs for a tunnel would depend on the soil conditions in the area and the type of tunneling method but would vary from approximately \$183 to \$495 million/mile for two tracks.

The Authority therefore finds that alternatives designed all above grade on a viaduct or all below grade in a trench or tunnel or sufficiently cost prohibitive as to be economically infeasible and rejects these alternatives for this reason.

Build the HST Project Completely Within Existing Transportation Corridors (BNSF/UPRR).

This suggested alternative includes commenter proposals to (1) build the HST alignment completely within the UPRR or BNSF corridors; or (2) to use these existing tracks for the HST. The suggested alternative to build the HST alignment completely with one of the existing freight rail corridors cannot meet the project's fundamental underlying purpose or objectives because

extended portions of these existing freight rail rights of way are not sufficiently straight to accommodate the design speed of the HST. To meet the design criteria for 220 mph train speeds, it will be necessary to have extensive divergence from the freight rail corridors to maintain sufficiently high speeds. For this technological reason, the Authority finds that an alternative that is constructed entirely within an existing freight rail corridor is infeasible and rejects it.

The suggested alternative to use the existing freight rail tracks for HST also cannot meet the project's fundamental underlying purpose or objectives because the existing UPRR and BNSF railroad rights of way cannot support 220 mph passenger service on the existing tracks. Neither the existing tracks nor the railroad bed were built to accommodate or meet minimum safety standards for high-speed rail operations. To meet the project safety requirements, dedicated track is needed where high-speed trains will travel at speeds of 220 mph. For these technological reasons, the Authority finds that an alternative that uses existing freight rail tracks is infeasible and rejects it.

Improve the Existing Amtrak Line and Do Not Build HST. This suggested alternative is discussed in FB-Response-GENERAL-2 in the Final EIR/EIS, which is hereby incorporated by reference. The underlying, fundamental purpose of this project is to construct and operate *high-speed* train service. The project is therefore designed to meet established HST performance criteria, as described in Table 2-1 of the Final EIR/EIS. The performance criteria include a system capability of traveling from San Francisco to Los Angeles in approximately 2 hours 40 minutes, and capability of safe, comfortable, and efficient operation at speeds over 200 mph. The Fresno to Bakersfield section of the HST System is critical to the overall ability to operate at high speeds (220 mph) and to achieve the fast travel times. Improving existing Amtrak lines would therefore fail to meet the project's underlying, fundamental purpose and the Authority rejects the alternative as infeasible for this reason.

Build the HST Around Bakersfield Instead of Through. This suggested alternative is discussed in FB-Response-GENERAL-25 in the Final EIR/EIS, which is hereby incorporated by reference. The Authority finds that additional alternatives for the Bakersfield area are not necessary because the Final EIR/EIS already has a reasonable range of alternatives in this area that permits a reasoned choice. The Authority further finds that it is not necessary to reject such alternatives now, in terms of decision making, because the Authority is not approving an alignment or station south of 7th Standard Road in Kern County.

5.3 Alternatives Previously Considered and Not Carried Forward for Study in the EIR/EIS

The Authority has undergone an extensive and public screening process for alternatives to study in the Project EIR/EIS. The many potential alternatives considered, but eliminated from detailed study, are summarized in Chapter 2 of the Final Project EIR/EIS and considered in the Preliminary Alternatives Analysis Report (June 2010), Supplemental Alternatives Analysis Report (September 2010), Supplemental Alternatives Analysis Report (May 2011), and Supplemental Alternatives Analysis Report (December 2011). The Authority finds that each potential alternative considered in these documents and not carried forward into the EIR/EIS for detailed study was appropriately eliminated. Such potential alternatives either failed to adequately meet the project purpose and need/project objectives, failed to offer a substantial environmental advantage to one or more of the alternatives studied in the EIR/EIS, and/or were deemed to not be feasible from a cost, technical, or engineering perspective. The Authority therefore finds all such alternative to be infeasible.

5.4 Preferred Alternative

The selection of the Preferred Alternative over the BNSF Alternative and other alternative alignments that deviate from the BNSF Alternative involves a series of tradeoffs and balancing considerations. Each of the north/south alignments presents different types and degrees of environmental impacts.

The Preferred Alternative is the combination of several alternative alignments and sections of the BNSF Alternative. The Preferred Alternative comprises the Hanford West Bypass 2 Alternative, below-grade option; the Corcoran Bypass Alternative; the Allensworth Bypass Alternative; the Wasco-Shafter Bypass Alternative; and the Bakersfield Hybrid Alternative. Of the 72 possible combinations of alternatives, the Preferred Alternative is the second most cost-effective alternative, costing an estimated \$6.82 billion, including the cost of property acquisition. This cost is about \$800 million less than the cost of the BNSF Alternative, which was selected in the Tier 1 document as the preferred alignment. The Preferred Alternative would have one of the shortest overall total lengths of track (114 miles), which would mean fewer acquisitions and relocations of properties purchased for the HST System. Also, the shorter track length of the Preferred Alternative would provide a travel time of 00:33:16, which is over 00:02:16 shorter than the time associated with the longest potential alternative. The Preferred Alternative would also have one of the shortest total lengths of elevated structures (26 miles) of the potential alternatives. The shorter the total length of elevated structures, the less the overall construction cost. Crossings over and under existing highways and roadways also pose special logistical concerns, both during construction and for operation and maintenance. The Preferred Alternative has 191 roadway crossings, which is only 3 more than the number of crossings associated with the BNSF Alternative (188). Although the Preferred Alternative has a greater total number of roadway crossings than the BNSF Alternative, the crossings associated with the Preferred Alternative would mostly occur in less-developed rural areas, which would offer greater ease and flexibility in construction than would roadway overcrossings and undercrossings in urban areas, where the overcrossings and undercrossings associated with the BNSF Alternative are situated. Also, rural road closures would typically affect a smaller volume of vehicle traffic than would road closures in urban cores. The Preferred Alternative would result in permanent conversion of Important Farmland to nonagricultural use (including potential conversion from parcel severance), permanent access severance, conflicts with farmland protection contracts (e.g., Williamson Act contracts), and indirect effects on dairies or other confined animal facilities. Impacts to Important Farmland would be less under the Preferred Alternative than under the BNSF Alternative. The Preferred Alternative would result in fewer effects on community resources than the BNSF Alternative. Overall, in balancing the effects on the natural and community resources, the Preferred Alternative minimizes environmental impacts the most. Of the alternative alignments, it would qualify as the LEDPA for issuance of the necessary Section 404 permits. Overall, the Preferred Alternative best meets the regulatory requirements and balances the minimization of impacts on the environment. It would avoid the greater impacts on the environment and the Ponderosa community east of Hanford, which the BNSF Alternative would divide, and would avoid the greater impacts on more urban areas, such as in the cities of Corcoran and Allensworth.

The Authority finds that the Preferred Alternative is the environmentally superior alternative overall that best meets the project purpose and need and project objectives.

5.5 Conclusion on Alternatives

In summary, the Authority finds that there are no feasible alternatives that would avoid or substantially lessen the significant adverse impacts of the Preferred Alternative that would remain after application of mitigation measures, while still meeting the project's underlying purpose and

project objectives. Because adverse environmental impacts remain, the Authority will adopt a Statement of Overriding Considerations, as discussed in the following chapter.

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6.0 Mitigation Measures Suggested by Commenters

Some of the comments on the Draft EIR/EIS and the Revised Draft EIR/Supplemental Draft EIS suggested additional mitigation measures and/or modifications to the measures recommended in these documents. Some comments also suggested additions to the project that are not necessarily connected to an adverse environmental impact. The mitigation measures recommended in the Draft EIR/EIS and Revised Draft EIR/Supplemental Draft EIS represent the professional judgment of subject matter experts on reasonable and feasible approaches to reduce significant adverse environmental impacts. Nevertheless, in many instances, the Authority and FRA have incorporated suggestions from comments to refine or improve mitigation. This discussion explains the reasons for not incorporating certain of the mitigation measures suggested in comments. The Authority considered the following points in determining whether to include a mitigation measure suggested in comments:

- Whether the suggestion relates to a significant and unavoidable environmental effect of the project, or instead relates to an effect that is already less than significant or can be mitigated to less than significant levels by proposed mitigation measures in the Draft EIR/EIS and the Revised Draft EIR/Supplemental Draft EIS;
- Whether the proposed language represents clear improvement, from an environmental standpoint, over the draft language that a commenter seeks to replace;
- Whether the proposed language is sufficiently clear as to be easily understood by those who will implement the mitigation as finally adopted;
- Whether the language might be too inflexible to allow for pragmatic implementation;
- Whether the suggestions are feasible from an economic, technical, legal, policy, or other standpoint;
- Whether the measure addresses an impact not caused by the HST project; and
- Whether the measure addresses a social or economic impact, as opposed to an impact on the physical environment.

Authority staff, with assistance from subject matter experts, has carefully considered mitigation measures proposed in comments. The following identifies suggestions for mitigation measures which the Authority has not incorporated and the rationale for not including the measure. The list below is not intended to be exhaustive; to the extent that suggestions on mitigation measures that were rejected are not identified below, the Authority finds, based on the analysis contained in the Final EIR/EIS and the record as a whole, that such suggestions are appropriately rejected for one or more of the reasons identified above.

Section 3.2, Transportation and Traffic

Measures that do not represent clear improvements, from an environmental standpoint, over the draft language that the commenter seeks to replace. The following mitigation measures were not adopted because they do not offer clear environmental benefits over the mitigation measures already incorporated and adopted by the Authority.

- Intersection #6 (SR 99 NB Ramps/Ventura Avenue): The intersection will meet signal warrants at the time of HST project completion. Road closures will increase traffic to this location and therefore the HST project should install the traffic signal with the initial project construction (Vol. IV, City of Fresno comment).

This mitigation measure is similar to the mitigation measures already incorporated in the project and does not offer any environmental benefits over the Authority's proposed mitigation measures. In particular, the FRA and the Authority will implement Mitigation Measure TR-MM#3 (Add Signal to Intersection to Improve LOS/Operation), this mitigation measure would add traffic signals to affected non-signalized intersections surrounding proposed HST station locations to improve LOS and intersection operation. Prior to the completion of civil work, the Authority shall install a traffic signal.

- Signalization/channelization to maintain local government LOS standards (Vol. IV, Kern Council of Governments comment).

This mitigation measure is similar to the mitigation measures already incorporated in the project and does not offer any clear environmental benefits over the Authority's adopted mitigation measures. In particular, the Authority will implement Mitigation Measure TR-MM#3 (Add Signal to Intersection to Improve LOS/Operation), this mitigation measure would add traffic signals to affected non-signalized intersections surrounding proposed HST station locations to improve LOS and intersection operation, and Mitigation Measure TR-MM#7: Add Exclusive Turn Lanes to Intersections, this mitigation measure would add exclusive turn lanes at specific intersections to improve LOS and intersection operations. Prior to the completion of civil work, the Authority shall construct improvements.

Measure Addresses an Impact that is Less than Significant. The following mitigation measures were not adopted because activities are part of the proposed project actions and impacts would be less than significant.

- The following additional mitigation is proposed by Kern Council of Governments:
 - a. Minimize impacts during rail construction by staggering truck routing between construction and aggregate source sites.
 - b. Monitor loaded aggregate truck weight to minimize degradation of existing road pavement conditions.
 - c. Fix any road condition degradation created by violence of loaded truck weight.
 - d. Ship aggregate via rail car rather than truck, whenever possible to minimize impacts to road system pavement as well as air quality and GHG emissions (Vol. IV, Kern Council of Governments comment).

As part of the project, the FRA and the Authority will implement Design Feature 5, Construction Truck Routes; this feature requires delivery of all construction-related equipment and materials on the appropriate truck routes and prohibits heavy-construction vehicles from accessing the site via other routes, Design Feature 6, Protection of Public Roadways during Construction; the feature requires repair any structural damage to public roadways, returning any damaged sections to their original structural condition, surveys of the condition of the public roadways along truck routes providing access to the proposed project site both before construction and after construction is complete, and a before- and after-survey report and submit to the Authority for review, indicating the location and extent of any damage, and Design Feature 8, Construction Transportation Plan; which the design-builder will prepare a detailed Construction Transportation Plan for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways. The Construction Transportation Plan will be prepared in close consultation with the pertinent city or county, and will be reviewed and approved by the Authority before commencing any construction activities. This plan will address, in detail, the activities to be carried out in each construction phase, with the requirement of maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the routing and

scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The plan will provide traffic controls pursuant to the *California Manual on Uniform Traffic Control Devices* sections on temporary traffic controls (Caltrans 2012).

- The HST project shall be responsible for the following mitigation measures within the City of Wasco:
 1. All existing road crossings to be re-constructed as grade separations.
 2. All roadway grade separations to be constructed to Ultimate Street design width per city's master plan circulation.
 3. If the HST crosses Highway 46 at-grade, the grade-separation shall be constructed as an underpass for Highway 46 at a width and design per Segment 3 of Caltrans Project Report for Highway 46 improvements (Vol. V, City of Wasco comment).

The city of Wasco has the potential to be affected by the BNSF Through-Wasco Alternative; however, the HST is proposed to be located on an elevated structure from First Street for a distance of about 3 miles and return to grade north of Kimberlina Road. No roads are proposed to be closed, and all crossings will be grade-separated.

- Commit in the Final EISs to design and construct stations to be pedestrian and bicycle-friendly by incorporating features such as bike lockers, changing rooms, and showers (Vol. IV, U.S. Environmental Protection Agency comment).

The Authority prepared and distributed Urban Design Guidelines (Authority [2010] 2011b) available on the Authority's website to provide assistance in urban planning for the stations to help achieve great placemaking. The guidelines are based on international examples where cities and transit agencies have incorporated sound urban design principles as integrated elements of large-scale transportation systems. The application of sound urban design principles to the HST System will help to maximize the performance of the transportation investment, enhance the livability of the communities it serves, create long-term value, and sensitively integrate the project into the communities along the HST System corridor. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in land use planning in the areas surrounding the stations.

- Adequate parking, including long-term parking (Vol. IV, Kern Council of Governments comment).

The proposed station would include a passenger drop-off area at the entrances to the station or in the parking area. The station parking areas would accommodate approximately 2,300 parking spaces at the Bakersfield Station. These parking facilities would be designed to accommodate demand and to avoid overflow parking on nearby area streets. Since the HST project includes a plan to provide adequate station parking, minimal impacts on the existing downtown parking conditions are expected. The Final EIR/EIS concluded these effects would be a less-than-significant impact.

- Design and construction of stations to be pedestrian and bicycle-friendly by incorporating features such as bike lockers, changing rooms, and showers (Vol. V, U.S. Environmental Protection Agency comment).

The Authority prepared and distributed Urban Design Guidelines (Authority [2010] 2011b) available on the Authority's website to provide assistance in urban planning for the stations to help achieve great placemaking. The guidelines are based on international examples where cities

and transit agencies have incorporated sound urban design principles as integrated elements of large-scale transportation systems. The application of sound urban design principles to the HST System will help to maximize the performance of the transportation investment, enhance the livability of the communities it serves, create long-term value, and sensitively integrate the project into the communities along the HST System corridor. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in land use planning in the areas surrounding the stations.

Measure Addresses an Impact Not Caused by the HST Project. The following mitigation measures were not adopted because the impact would not be caused by the HST project.

- Construct a pedestrian bridge crossing the HST and BNSF rail facilities along the 6th Street alignment (Vol. V, City of Wasco comment).

The BNSF Alternative would be located on an elevated structure when crossing 6th Street, and therefore would have to be grade-separated from pedestrian crossings.

- Provide connectivity alternatives for Wasco residents who wish to take Amtrak (Vol. IV, City of Wasco comment).

The HST project will not discontinue Amtrak service in Wasco. The mitigation measure is therefore not necessary.

- As mitigation, a bike path facility adjacent to the HST alignment should be provided to connect Wasco and Shafter with the Bakersfield bike path system (Vol. IV, Kern Council of Governments comment).

The HST project will not preclude the future development of a bike path or the Kern County Bicycle Plan. This measure is not needed, however, to reduce a significant impact of the project.

Measure Does Not Address an Impact on the Environment and/or Measure Addresses an Impact that is Less than Significant. The following mitigation measures were not adopted because the impact is not an impact on the environment and/or because they address an impact that is less than significant or will be less than significant with implementation of the adopted mitigation measures.

- Similar to an airport surcharge, a mitigation mechanism will be needed to fund the feeder bus system, such as a ticket surcharge supporting local bus and rail transit (Vol. IV, Kern Council of Governments comment).
- Local transit service improvements to Bakersfield high-speed rail station, including an additional adjacent transit center and additional ingress/egress improvements for the buses (Vol. IV, Kern Council of Governments comment).
- GET service to Meadows Field (Airport) will require capital and/or operational enhancements to provide additional transit service.
- KRT, the intercity transit service for Kern County, will require and/or operational enhancements to provide feeder routes to the Bakersfield high-speed rail station from Arvin/Lamont, Frazier Park, Taft/Maricopa, Shafter/Wasco, and McFarland/Delano (Vol. IV, Kern Council of Governments comment).
- Funding for these projects should be provided as a mitigation measure (Vol. IV, Kings County Association of Governments comment).

The project would not result in a significant adverse impact to the regional transportation system. Local bus feeder/transit service is not in the project's scope; however, the HST will not preclude future or impede existing intracity and intercity bus/transit routes. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in planning for the integration of transit service with the high-speed rail and to update land use plans in the areas surrounding the stations.

- As part of transit connectivity plans, commit to working with local agencies to develop features to facilitate easy transfers between local transit and HST, such as shared ticketing, wayfinding for local transit within HST stations, and other features (Vol. IV, U.S. Environmental Protection Agency comment).

The project would not result in a significant adverse impact to the regional transportation system. Local bus feeder/transit service is not in the project's scope; however, the HST will not preclude future or impede existing intracity and intercity bus/transit routes. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in planning for the integration of transit service with the high-speed rail and to update land use plans in the areas surrounding the stations.

- Commit to coordinate with car share organizations and promoting use of shared vehicles at HST stations to provide an additional alternative to car ownership (Vol. IV, U.S. Environmental Protection Agency comment).
- Coordination with car share organizations and promote use of shared vehicles at HST stations to provide an additional alternative to car ownership (Vol. V, U.S. Environmental Protection Agency comment).
- Coordination transit service and/or ride-sharing to connect HMF sites to population centers, to promote an alternative to single-occupant vehicles for employee's commutes (Vol. V, U.S. Environmental Protection Agency comment).

A car share program is not in the project's scope; however, the HST will not preclude future or impede existing programs. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in planning for the integration of alternative transit service with the high-speed rail and to update land use plans in the areas surrounding the stations. Further, with implementation of the adopted mitigation measures, the project would not result in any significant and unavoidable air quality impacts; therefore, this recommendation is not necessary to further reduce the project's air quality impacts.

- Features to facilitate easy transfer between local transit and HST, such as shared ticketing, wayfinding for local transit with HST stations, and other features (Vol. V, U.S. Environmental Protection Agency comment).

The project would not result in a significant adverse impact to the regional transportation system. Local bus feeder/transit service is not in the project's scope; however, the HST will not preclude future or impede existing intracity and intercity bus/transit routes. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in planning for the integration of transit service with the high-speed rail and to update land use plans in the areas surrounding the stations.

- Kern Council of Governments requests that mitigation include funding for dedicated van pools or bus rapid transit for employees to reduce vehicle trips and emissions (Vol. V, Kern Council of Governments comment).

Local bus feeder/transit service is not in the project's scope; however, the HST will not preclude future or impede existing intracity and intercity bus/transit routes. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in planning for the integration of transit service with the high-speed rail and to update land use plans in the areas surrounding the stations. Further, with implementation of the adopted mitigation measures, the project would not result in any significant and unavoidable air quality impacts; therefore, this recommendation is not necessary to further reduce the project's air quality impacts.

- Enter an agreement with the Amtrak service provider and other appropriate entities to avoid reduction of the existing number of Amtrak San Joaquin trains servicing the stops along the BNSF between Bakersfield and Fresno. Interim use of the Initial Construction Segment (ICS) should only use additional trainsets, and not simply take the Amtrak San Joaquin service off the BNSF and move them over to the ICS, thereby eliminating Amtrak Service to Hanford, Corcoran, Allensworth and possibly Wasco. The agreement should include a commitment to use revenue from other parts of Amtrak San Joaquin Service to help keep service to these communities open (Vol. V, Kern Council of Governments comment).

Any potential interim use of the ICS is not being determined now as part of the current project, although the Final EIR/EIS describes how such interim use by Amtrak might occur. It is anticipated that any service on the ICS by Amtrak would be additive to existing service. No reduction in existing transportation service is anticipated.

- Enter an agreement with the Amtrak service provider and other appropriate entities to add additional train stops to the Amtrak San Joaquin service between Fresno and Bakersfield. Acquire property; build platforms, parking, access and amenities as appropriate. These stations would be serviced by the existing 12 Amtrak San Joaquin trains per day as regular or requested stops (i.e., Allensworth), with locations consistent with the Kern Commuter Rail Study (http://www.kerncog.org/docs/studies/Kern_County_Short_Line_Rail_Study_2011.pdf) or other appropriate studies. These stations would provide opportunities for additional riders to mitigate the shift to HST or interim ICS use (Vol. V, Kern Council of Governments comment).

The project would not result in a significant adverse impact to the regional transportation system. Improvements and additions to the Amtrak system are not part of the HST project. The HST project will not preclude Amtrak or any other entity from adding additional stops to the Amtrak system.

- Add a station to the Amtrak San Joaquin service at the site of the future HMF as early as possible. This station would provide additional ridership to the existing San Joaquin service from commuters and visitors. Relocate HST Authority staff offices to the HMF prior to interim use of the ICS or the Initial Operating Segment (IOS) to help offset the loss of ridership revenue while providing opportunity for closer oversight of the ICS construction (Vol. V, Kern Council of Governments comment).

This is a thoughtful planning suggestion that the Authority will consider as it continues to plan for operation of electrified passenger service. The suggestion, however, does not address a significant environmental impact. The project would not result in a significant adverse impact to the regional transportation system. Improvements and additions to the Amtrak system are not part of the HST project. The HST project will not preclude Amtrak or any other entity from adding additional stops to the Amtrak system.

- Provide additional Amtrak Thru-Way connector bus service for the additional trains using this ICS for express service to connect between San Jose Caltrain/Fresno, Stockton Altamont

Commuter Express (ACE)/Fresno, and Bakersfield/So. Cal MetroLink. This service would need to remain in place until the HST service can be extended to make these connections to other existing passenger rail service in California (Vol. V, Kern Council of Governments comment).

The project would not result in a significant impact to the regional transportation system. Improvements and additions to the Amtrak system are not part of the HST project. The HST project will not preclude Amtrak or any other entity from adding additional stops to the Amtrak system.

- Provide additional Amtrak Thru-Way connector bus service to communities for which passenger rail revenue no longer is able to support service at current subsidy levels despite implementation of all mitigation efforts. When connector bus ridership levels demonstrate that service would be viable once again, re-establish passenger rail service (Vol. V, Kern Council of Governments comment).

The project would not result in a significant adverse impact to the regional transportation system. Improvements and additions to the Amtrak system are not part of the HST project. The HST project will not preclude Amtrak or any other entity from adding additional stops to the Amtrak system.

- If passenger rail revenue is no longer able to support service at normal subsidy levels, enter into an agreement with the appropriate entities to preserve existing scheduled passenger rail slots on the BNSF corridor along with trainsets and equipment to ensure that ridership can be re-established (Vol. V, Kern Council of Governments comment).

The project would not result in a significant adverse impact to the regional transportation system. Improvements and additions to the Amtrak system are not part of the HST project. The HST project will not preclude Amtrak or any other entity from adding additional stops to the Amtrak system.

- Provide feeder routes to the Bakersfield station from Arvin/Lamont, Frazier Park, Taft/Maricopa, Shafter/Wasco, and McFarland/Delano. This mitigation measure will also enhance HST ridership and improve the viability of the system (Vol. V, Kern Council of Governments comment).

The project would not result in a significant adverse impact to the regional transportation system. Local bus feeder/transit service is not in the project's scope; however, the HST will not preclude future or impede existing intracity and intercity bus/transit routes. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in planning for the integration of transit service with the high-speed rail and to update land use plans in the areas surrounding the stations.

Section 3.4, Noise and Vibration

Measures that do not represent clear improvements, from an environmental standpoint, over the draft language that the commenter seeks to replace. The following mitigation measures were not adopted because they are similar to, and otherwise do not offer clear environmental benefits over, the mitigation measures already incorporated and adopted by the Authority.

- Ensure an interior L_{dn} of 45 dB or less within the hospital (Vol. V, Mercy Hospital comment).

Noise impacts have been calculated for all floors of the hospital, and the proposed mitigation will protect each of the floors of the hospital. The Authority will, however consider this suggestion in conjunction with future decisions regarding an alignment through Bakersfield.

- Noise mitigation measures should include the source treatments, which include vehicle noise specifications, wheel treatments, vehicle treatments, and guideway support (Vol. V, Mercy Hospital comment).

This measure is similar to, and not a clear improvement over, N&V-MM#4: Vehicle noise specifications, and N&V-MM#5: Special trackwork at crossovers and turnouts. Both measures involve noise source treatments. In particular, N&V MM#4 provides that in the procurement of an HST vehicle technology, the Authority will require bidders to meet the federal regulations (40 CFR Part 201.12/13) at the time of procurement for locomotives (currently a 90-dB-level standard), for cars operating at speeds of greater than 45 mph. N&V-MM#5 provides for track treatments to reduce rail gap noise at turnouts.

In addition to the already existing mitigation measures, the Project's Design Features require the use of continuous welded rail to reduce the impact sounds of the steel wheels on the rail gaps, and the use of cowlings (streamlined coverings) on the pantographs to reduce aerodynamic noise

- The following changes to mitigation measure N&V-MM#1 are required to control HST project construction noise impacts: (1) Construction sound barriers shall be of sufficient height to interrupt the line-of-sight between the construction activity and receptor location; (2) Prohibit nighttime construction in residential areas; (3) Establish a noise hotline and community liaison to address noise complaints and require severe financial penalties for repeat violations of the established noise limits; and (4) Prohibit impacted pile driving within 50 feet of all buildings. further, as the EIR/EIS indicates that "Local ordinances and the standards will always take precedence over the 'reasonable guidelines' established by the FRA" (Authority and FRA 2012, page 8-3), permitted hours of construction shall be in accordance with the City of Bakersfield's Noise Ordinance and be applied to noise sensitive commercial uses, such as those at the Bakersfield Commons site (Vol. V, Coffee-Brimhall, LLC comment).

Mitigation Measure N&V-MM#1 will be effective at reducing the project's construction noise impacts to less-than-significant levels. (Final EIR/EIS, Table 3.4-35.) That measure requires the construction contractor to monitor construction noise to verify compliance with the noise limits shown in Table 3.4-1 of the Final EIR/EIS, which serve as performance standards to guarantee that construction noise impacts will not exceed less-than-significant levels. The mitigation measure provides the contractor with flexibility to meet the FRA construction noise limits in the most cost-effective manner. This can be done by either prohibiting certain-noise generating activities during nighttime hours (as recommended by the contractor) or by providing additional noise control measures to meet the noise limits. A noise-monitoring program will be developed as part of Mitigation Measure N&V-MM#1 to meet the required noise limits. Measures included in the noise-monitoring program may include installation of a temporary construction site sound barrier near a noise source or the use of moveable sound barriers at the source of the construction activity (consistent with recommendation #1 of the comment); avoidance of nighttime construction in residential neighborhoods (consistent with recommendation #2 of the comment); the use of an auger to install piles instead of a pile driver or, if pile driving is necessary, limiting the time of day that the activity can occur (which will be equally as effective as recommendation #4 of the comment in that collectively, the noise-monitoring program will achieve the FRA's construction noise limits to ensure impacts are less than significant). The monitoring-program and compliance with the project's Mitigation Monitoring and Reporting Program will ensure that violations of the noise limits do not occur (which will be equally as effective as recommendation # 3 of the comment). Because Mitigation Measure N&V-MM#1 will be equally as effective as the mitigation measures recommended by the comment, but will also provide the construction contractor with flexibility to limit construction noise in the most efficient and cost effective manner, while still achieving the specific performance standards specified by the FRA, the Authority finds that Mitigation Measures N&V-MM#1, as proposed and adopted, is preferable to the mitigation measures recommended by the comment.

The Authority has, however, incorporated the following component of this suggested mitigation measure into N&V-MM#1:

- CHSRA will establish and maintain in operation until completion of construction a toll-free "hotline" regarding the Section construction activities. CHSRA shall arrange for all incoming messages to be logged (with summaries of the contents of each message) and for a designated representative of CHSRA to respond to hotline messages within 24 hours (excluding weekends and holidays). CHSRA shall make a reasonable good faith effort to address all concerns and answer all questions, and shall include on the log its responses to all callers. CHSRA shall make a log of the in-coming messages and CHSRA's responsive actions publicly available on its website.
- Mitigation for construction noise should include a requirement to adhere to the city's noise requirements and restrictions on construction activities in and around school areas to weekends and near all other sensitive receptors to weekdays and daytime hours only (Vol. V, City of Bakersfield comment).

The Authority will consider the suggested mitigation measure for construction in conjunction with future decisions regarding an alignment through Bakersfield.

Section 3.6, Public Utilities and Energy

Measure Addresses an Impact that is Less than Significant. The following mitigation measures were not adopted because activities are part of the proposed project actions and impacts would be less than significant.

- All existing and Master Planned sewer, water, and recycled water facilities crossing the existing tracks and future HST tracks shall be required to have steel casings. Any relocation or abandonment of existing water and/or sewer lines shall be required to maintain service to all parcels. Replacement lines must be constructed to City of Fresno Standards. Also, all existing valves, manholes, and any other above ground appurtenances shall be relocated outside of the proposed HST right-of-way. HST shall provide steel casings crossing the alignment of the HST for future recycled water lines (Vol. IV, City of Fresno comment).

The HST project would not negatively affect the integrity of existing mains or preclude the installation of new mains across the HST right-of-way. In areas where the HST route would be elevated in the city of Fresno, it is likely that disturbance to these pipelines would be avoided during final engineering design for the specific placement of columns. However, where existing underground utilities, such as sewer and water pipelines, cross the HST alignment, these affected utilities would be placed in a protective steel casing. The Authority would work with the appropriate municipal authorities, such as the city's public works department, to relocate services so they do not conflict with HST infrastructure. Where replacement lines are required, HST's contractor will replace them in accordance with State law requirements and established requirements of the entity having jurisdiction over the pipelines. Design requirements are part of the project, and do not need to be addressed by additional mitigation requirements. Refer to Section 3.6 Public Utilities and Energy for additional information.

Providing protective casing for pipelines is part of the proposed project actions and does not need to be a mitigation measure.

- Existing water mains crossing the proposed HST alignment shall be maintained by reconstructing them in steel casings to allow the City of Fresno to maintain these facilities from outside the HST right-of-way (Vol. IV, City of Fresno comment).

Existing water mains crossing the HST right-of-way will be maintained during the relocation or protection-in-place of these lines. Water lines crossing the HST right-of-way will be encased, in steel casings, and the length of the casing will be extended sufficiently beyond the HST right-of-way so that future access to the casings can be made without affecting the HST right-of-way.

- Related water system appurtenances such as valves, blow-offs, air release assemblies, etc., shall be relocated outside the HST right-of-way (Vol. IV, City of Fresno comment).

As part of the project, all related appurtenances to water lines and their casings will be placed outside the HST right-of-way, so that any maintenance of the water lines can be performed without the need to access the HST right-of-way.

- Where water main crossings will exist outside the public right-of-way, the project shall provide dedicated water main easements to the city for the ongoing operation and maintenance of the facilities (Vol. IV, City of Fresno comment).

As part of the project, if an existing water line, which is located in private property and has its own easement, requires relocation and the relocation places the water line in a private property, the Authority will work with the affected utility owner to obtain a new easement for the relocated water line.

- The City reserves its right to increase the size of existing crossings or propose additional crossings as necessary to ensure existing levels of water service are maintained (Vol. IV, City of Fresno comment).

Appropriate sized casings will be provided for all utilities crossing the HST right-of-way. Any requests to increase the size of an existing facility or accommodate installation of a future facility would be negotiated between the City of Fresno and the Authority. Future utilities would be allowed to cross the HST right-of-way subject to obtaining permits from the Authority and meeting the requirements of HST design criteria. The Authority and its contractor(s) will continue to work with the City of Fresno to ensure the design and relocation/protection of water mains and other utilities meet the requirements of the city.

Providing protective casing for pipelines, and coordination with city is part of the proposed project actions and does not need to be a mitigation measure.

- The Draft EIR Section 3.8-10 states that the HMF site will connect to the municipal water supply where possible and practicable. If the HMF Fresno Works alternative is selected and will obtain water service from the city, the following provisions must be satisfied:
 - The HST project shall submit an application to the Fresno County Local Agency Formation Commission seeking authorization to expand Fresno's water service boundaries and provide water service to the Fresno Works site.
 - The HMF Fresno Works Alternative property is not fully located within the City of Fresno's 2025 General Plan boundary and was not included in the 2008 Fresno Urban Water Management Plan. Therefore, no water allocation was identified for this portion of the site. The HST project shall provide an annual water usage analysis and provide the City of Fresno with a supply of water equivalent to the demand.
 - The HST project shall submit water system improvement plans showing the location of all main extensions and all irrigation, fire, and domestic water services to be provided by the City of Fresno. Include on the plans the location of all reduced pressure backflow prevention devices for all services (see City Standards for acceptable locations). Any proposed city water mains shall be looped; dead end water mains will not be allowed.
 - Payment of the standard impact and connection fees for the facility.

- Seal and abandon existing onsite well(s) in compliance with the State of California Well Standards, Bulletin 74-90 or current revisions issued by California Department of Water Resources and City of Fresno standards.
- If the HMF Fresno Works alternative is selected and will obtain its water supply through the development of groundwater wells, the City of Fresno, Department of Public Utilities, Water Division recommends that the HST project identify groundwater mitigation measures to offset its groundwater demand through the implementation of water recycling, reuse, and aquifer recharge. The mitigation shall have a net zero impact on groundwater resources (Vol. IV, City of Fresno comment).

The designs presented in the Revised DEIR/Supplemental DEIS are preliminary. A decision on the HMF location is not being made at this time. If the Fresno Works–Fresno HMF Site is ultimately selected as the HMF location, the Authority will coordinate with the city to refine the HMF design and coordinate provisions for water service from the city of Fresno. If water service is requested from the City of Fresno the Authority, municipal design guidelines and specifications will be employed in any relocation. Master agreements would be negotiated with each agency to ensure that the requirements and standards of each agency are followed by the design-build contractor. If expansion of Fresno’s water service boundaries is necessary, the Authority will work with the city to apply for any approvals necessary for that expansion. If any wells need to be sealed or relocated, the State of California Well Standards would apply to any onsite well abandonment, and no additional mitigation measures are necessary to ensure compliance.

The projected water demand was determined not to have significant drawdown effects on the groundwater resources. The HMF would require approximately 52 acre-feet per year of water on average for domestic use. Refer to Section 3.6.5 and Section 3.8.5 for further details. However, as discussed in Section 3.8, Hydrology and Water Resources, drawdown effects would be negligible. No entitlements are necessary to pump groundwater. The Authority will require additional protective measures (i.e., casing and clearances) as defined in their technical memorandums to ensure protection of the HST facilities.

Coordination with municipal and private utility providers and access to existing or modified utility corridors is identified as a part of the proposed action and identified in the EIR/EIS. Adding coordination as a mitigation measure is unnecessary.

- The city requests that the following mitigation measures be included in the EIR/EIS so as to address the potentially significant impacts to the city's sewer utilities and service system:
 - Any change in direction of the sewer collection system must occur at a manhole to allow access to each reach for inspection and cleaning.
 - Any new sewer collection system manhole or structure installed with the project must be placed at a location approved by the city to ensure ready access by city of Fresno Collection System Maintenance crews, equipment, and vehicles. Access must allow for the proper, safe, and efficient orientation of equipment and vehicles. This includes acquiring any necessary right-of-ways or easements.
 - Plans for the construction of any new structures associated with the project shall be submitted to the city for its review and approval to ensure that the proposed construction does not impact ready access to existing sewer collection system manholes or other sewer collection system structures by City of Fresno Collection System Maintenance crews, equipment, and vehicles. Access must allow for the proper, safe, and efficient orientation of equipment and vehicles. This includes acquiring any necessary right-of-ways or easements. Any proposed bypass during construction of new mains would be subject to the requirements of the City of Fresno (Vol. V, City of Fresno comment).

The relocation and/or protection of sanitary sewer lines will be performed per the established requirements of the entity having jurisdiction over the sanitary sewer and the Authority's requirements for when utilities cross the HST right-of-way. Per contract requirements, the Contractor is required to coordinate its design and construction activities related to relocation and/or protection of the sanitary sewer with the jurisdictional entity and obtain its review and comment prior to any construction impacting the sanitary sewer.

Coordination with municipal and private utility providers and access to existing or modified utility corridors is identified as a part of the proposed action and mentioned in the EIR. Adding coordination as a mitigation measure is unnecessary.

- The HST project has the potential to both significantly impact the integrity of the existing mains and thus significantly impact public health and safety, as well as to restrict the city's future growth through construction of the HST corridor which could preclude the installation of new mains across the HST right-of-way. Therefore we request that the following mitigation measure be included in the EIR/EIS to address this concern:
 - The Authority shall be required to install steel casings meeting city specifications and standards on all existing and Master Planned sewer, water, and recycled water facilities crossing the existing tracks and future HST tracks. Any relocation or abandonment of existing water and/or sewer lines shall be required to maintain service to all parcels. The Authority shall construct all replacement lines to City of Fresno Standards. In addition, the Authority shall relocate all existing valves, manholes, and any other above ground appurtenances outside of the proposed HST right-of-way. The Authority shall also provide steel casings meeting city standards and specifications crossing the alignment of the HST for future recycled water lines (Vol. V, City of Fresno comment).

As part of the project, appropriate size casing will be provided for all utilities crossing the HST right-of-way. Any requests to increase the size of an existing facility or accommodate installation of a future facility would be negotiated between the City of Fresno and the Authority. State law requires HST to accommodate future utility needs for crossings. Any third party pipelines that need to be moved will be installed in steel casings under the design standards that the Authority and its Contractor must follow. Future utilities would be allowed to cross the HST right-of-way subject to obtaining permits from the Authority and meeting the requirements of HST design criteria.

Placement of affected utility routes within steel casings identified as a part of the proposed action and mentioned in the EIR. Adding coordination as a mitigation measure is unnecessary.

- To address this potentially significant impact, the city requests that the following mitigation measures be added to the EIR/EIS:
 - a. The Authority shall maintain the existing water mains crossing the proposed HST alignment by reconstructing them in steel casings meeting city standards and specifications so as to allow the City of Fresno to maintain these facilities from outside the HST right-of-way.
 - b. That Authority shall relocate related water system appurtenances such as valves, blow-offs, air release assemblies, etc., outside the HST right-of-way to locations acceptable to the city's Water Division.
 - c. Where water main crossings will exist outside the public right-of-way, the Authority shall dedicate water main easements to the city to provide access for the ongoing operation, repair and maintenance of these facilities.

- d. The Authority shall ensure that the city reserves its right to increase the size of existing crossings or to propose additional crossings as necessary to ensure that existing levels of water service are maintained (Vol. V, City of Fresno comment).

Placement of affected utility routes within steel casings and related equipment (values, etc.) is identified as a part of the proposed action and mentioned in the EIR, as is continued access by the city for maintenance. Adding coordination as a mitigation measure is unnecessary.

Section 3.7, Biological Resources and Wetlands

Measures that do not represent clear improvements, from an environmental standpoint, over the draft language that the commenter seeks to replace. The following mitigation measures were not adopted because they are similar to, and otherwise do not offer clear environmental benefits over, the mitigation measures already incorporated and adopted by the Authority.

- Exclusion fencing must be installed so it is at least 50 feet from burrows. Because CTS can travel up to 1.3 miles a 250-foot buffer is not sufficient (Vol. V, California Department of Fish & Wildlife comment).

If a California tiger salamander is identified in the construction and project footprint during protocol-level surveys or visual pre-construction surveys, the Authority will initiate consultation with the CDFW and obtain an Incidental Take Permit. There is currently no known aquatic breeding habitat in the habitat study area that overlaps with the Cross Creek region. The closest aquatic breeding habitat which may be a potential source of California tiger salamanders is located approximately 1 mile away. As described in Bio-MM#25, in the unlikely event that suitable breeding habitat is located within the project footprint or surrounding 250-foot buffer, the Contractor will restrict construction activities within 250 feet of the potential California tiger salamander breeding habitat during the wet season. Based on the analysis of potentially suitable habitat discussed in the Biological Resources and Wetland Technical Report, it is not anticipated that California tiger salamander will access the proposed alignment due to an absence of breeding habitat within 250 feet of the project footprint and the existing physical barriers between the potential source of California tiger salamanders and the alignment (Authority and FRA 2012). The 250-foot work buffer is designed so that there are no indirect impacts from construction activities to the suitable breeding habitat during the wet season.

As described in Bio-MM#7 and Bio-MM#8, the ESA and wildlife exclusion fence will be installed by the project biologist in a manner that routes the fence line around any burrows entrances that may be present. The wildlife exclusion fence would be implemented to prevent California tiger salamanders (and other special-status species) from gaining access to the project area during construction where they could be subject to mortality. As proposed, BIO-MM #7 and BIO-MM#8 will provide the same level of protection to the species as the 50-foot buffer recommended by CDFW.

- Rather than a 250-foot buffer for vernal pools, BIO-MM#19 should require work to be limited within the watershed of any vernal pool (Vol. V, Land Protection Partners comment).

The 250-foot buffer in Mitigation Measure BIO-MM#19 is adequate to reduce impacts on vernal pool habitat. As stated in the measure, to prevent impacts during the wet season (October 14–June 1), exclusion fencing and erosion control measures will be installed. These restrictions are subject to revision by regulatory agencies including U.S Fish and Wildlife Service and the U.S. Army Corps of Engineers.

- Regarding Mitigation Measure BIO-MM#44, other projects in California require a 500-foot buffer around badger dens (Vol. V, Land Protection Partners comment).

The buffers contained in Bio-MM#44 are proposed based on the professional judgment of subject matter experts that they are adequately protective and both avoid direct impacts and mitigate indirect impacts. The mitigation measure includes weekly monitoring and reporting. In addition, the buffers proposed in Mitigation Measure BIO-MM#44 are subject to approval by the appropriate regulatory agency (California Department of Fish & Wildlife). This existing measure is therefore sufficient and reduces impacts to a less than significant level.

- BIO-MM#47 appears to imply that temporary impacts to riparian habitats can be completely offset by revegetation (through the use of “appropriate plants and seed mixes”). This may not be true and performance measures that incorporate all elements of the riparian community (Including invertebrates) must be used to confirm that native diversity is restored at the sties following disturbances or other compensatory mitigation must be required to make up for the difference in habitat quality before and after project implementation (Vol. V, Land Protection Partners comment).

The biological mitigation measures should be read in context. As stated in BIO-MM#47, BIO-MM#6 requires that during final design, the Project Botanist will prepare a Restoration Revegetation Plan (RRP) for temporarily disturbed upland communities. Site restoration will also be conducted to restore temporary impacts on valley foothill riparian areas (BIO-MM#47) and jurisdictional waters (BIO-MM#48). Furthermore, the restoration of temporary impacts on jurisdictional waters will be carried out in accordance with CMMP (Mitigation Measure BIO-#62), which will be developed in cooperation with regulatory agencies including the U.S. Army Corps of Engineers, the State Water Resources Control Board, and the California Department of Fish and Wildlife. The plan will include all required avoidance, minimization, mitigation, and monitoring measures. The plan will also address mitigation for the lost conditions, functions, and values of impacts on waters consistent with agency requirements. Examples of potential success criteria are proposed in this measure and would include criteria for plant cover, habitat functions, and species diversity. The existing measures are sufficient and reduce impacts to riparian habitats to a less than significant level.

Section 3.12, Socioeconomics, Communities, and Environmental Justice

Measures that do not represent clear improvements, from an environmental standpoint, over the draft language that the commenter seeks to replace. The following mitigation measures were not adopted because they are similar to either a project design feature or mitigation measure already incorporated and adopted by the Authority and otherwise do not offer clear environmental benefits over the project’s design features and mitigation measures.

- Requests mitigation to address adverse effects on Environmental Justice populations and business owners, including job opportunities, through training, and relocation assistance (Vol. IV, KMCA/SJVBCA comment).

Economic and social changes resulting from a project, such as adverse impacts on Environmental Justice populations and business owners, are not environmental impacts within the meaning of CEQA (CEQA Guidelines, § 15064, subd. (e)). Nevertheless, the Authority has adopted an Environmental Justice Policy (August, 2012), addressing these concerns. Consistent with the Authority’s Environmental Justice Policy, the project will ensure that adverse effects on Environmental Justice populations and business owners are minimized. In particular, to help offset any disproportionate effects, the Authority has approved a Community Benefits Policy, which supports employment of individuals who reside in disadvantaged areas and those designated as disadvantaged workers, including veterans returning from military service. The policy will help to remove potential barriers to small businesses, disadvantaged business enterprises, disabled-veteran business enterprises, women-owned businesses, and microbusinesses that want to participate in building the high-speed train system. Under the

Authority's Community Benefits Policy, design-build construction contracts will be required to adhere to the National Targeted Hiring Initiative, which states a minimum of 30% of all project work hours will be performed by national targeted workers and that a minimum of 10% of national targeted workers hours will be performed by disadvantaged workers.

The Community Benefits Policy will supplement the Authority's Small Business Program, which has an aggressive 30% goal for small-business participation, and includes goals of 10% for disadvantaged business enterprises and 3% for disabled-veteran business enterprises.

- The Authority should ensure that close to 100% of the relocated businesses remain in Fresno by encouraging the State Legislature to adopt various financial incentives (Vol. IV, City of Fresno).

As noted, economic and social changes resulting from a project are not environmental impacts within the meaning of CEQA. Nevertheless, the property acquisition and compensation plan includes provisions to ensure relocated businesses remain fully operational at their new location, including the potential for renovating existing structures to fit the needs of the business. Individual acquisition and access issues will be determined during the property acquisition process.

- Requesting the Authority establish transportation (vanpools, carpools, etc.) from small cities to HST stations to allow small Environmental Justice communities easy access to HST (Vol. IV, Central Valley Air Quality Coalition comment).

Although CEQA does not require consideration of Environmental Justice impacts, in accordance with Executive Order 12898 and the Authority's Environmental Justice Policy, the EIR/EIS considered offsetting benefits when evaluating potential disproportionately high and adverse effects on minority and low-income populations. The proposed HST project would bring economic benefits to the study region, including jobs and related income. HST construction and operation jobs would be filled by the regional labor force, so the project would benefit regional workers broadly, and the Community Benefits Policy adopted by the Authority would support employment of disadvantaged workers. Station-related benefits, including improved accessibility and potential property value increases, would most benefit those who live closest to the new stations. In Fresno and Bakersfield, the people who live closest to the new stations would be the adjacent minority and low-income communities. The Kings/Tulare Regional Station is in a sparsely populated area that would bring neither disproportionate adverse effects nor benefits to minority and low-income populations.

- The Bakersfield Homeless Center would like to stress to the Authority the importance of providing an alternative location the Bakersfield Homeless Center upon adoption of the B3 alignment. Further, since the construction of the platform would necessitate closure of the Center, the Bakersfield Homeless Center requires the transition to the new site be seamless with zero interruption in services to our population, any kind of disruption would create stress on families already in crisis, but also increased pressure for an already stressed safety net (Vol. V, Bakersfield Homeless Center comment).

The Bakersfield Homeless Center/Shelter will not be impacted by the Preferred Alternative north of 7th Standard Road. Further response is therefore not required. Nevertheless, in answer to the suggestion, the Authority notes that Mitigation Measure SO-4 (implement measures to reduce impacts associated with the relocation of important facilities) would apply to the Bakersfield Homeless Shelter, were the shelter affected by the project. The Authority would consult with these respective parties before land acquisition to assess potential opportunities to reconfigure land use and buildings and/or relocate affected facilities, as necessary, to minimize the disruption of facility activities and services, and also to ensure relocation that allows the community

currently served to continue to access these services. This mitigation measure would be effective in reducing the impacts of the project to less-than-significant by completing new facilities before necessary relocation, and by involving affected facilities in the process of identifying new locations for their operations. The Authority, as required under the Uniform Act and California Relocation Assistance Act (CRAA), bears the cost of compensation for the displaced facilities.

- The Authority should implement available measures to maximize local employment opportunities with the HST project to ensure equitable access to employment for local residents (Vol. V, City of Fresno comment).

Economic and social impacts are not environmental impacts requiring mitigation under CEQA. Nevertheless, the Authority has approved a Community Benefits Policy that helps to remove potential barriers to small businesses, disadvantaged business enterprises, disabled veteran business enterprises, women-owned businesses, and microbusinesses that want to participate in building the High-Speed Rail system. Under the Authority's Community Benefits Policy, design-build construction contracts will be required to adhere to the National Targeted Hiring Initiative, which states a minimum of 30 percent of all project work hours shall be performed by National Targeted Workers and a minimum of 10 percent of National Targeted Workers hours shall be performed by disadvantaged workers.

- The Authority should put in place an actual program to address impact & provide real mitigation effort for resident living in environmental justice communities along route alignment get them able & ready to be included with construction of this project (Vol. V, Kern Supporter for High Speed Rail comment).

Economic and social impacts are not environmental impacts requiring mitigation under CEQA. As described in the Revised Draft EIR/Supplemental EIS, and the Final EIR/EIS, however, jobs created by construction and operation of the project are anticipated be filled by workers in the region. To help offset any disproportionate effects, the Authority has approved a Community Benefits Policy that supports employment of individuals who reside in disadvantaged areas and those designated as disadvantaged workers, including veterans returning from military service. It helps to remove potential barriers to small businesses, disadvantaged business enterprises, disabled veteran business enterprises, women-owned businesses, and microbusinesses that want to participate in building the High-Speed Train system. Under the Authority's Community Benefits Policy, design-build construction contracts will be required to adhere to the National Targeted Hiring Initiative, which states a minimum of 30 percent of all project work hours shall be performed by national Targeted Workers and a minimum of 10 percent of National Targeted Workers hours shall be performed by disadvantaged workers. According to the National Targeted Hiring Initiative, disadvantaged workers either live in an economically disadvantaged area or face any of the following barriers to employment: being homeless, a custodial single parent, receiving public assistance, lacking a GED or high school diploma, having a criminal record or other involvement with the criminal justice system, chronically unemployed, emancipated from the foster care system, being a veteran, or an apprentice with less than 15 percent of the required graduating apprenticeship hours in a program. The Community Benefits Policy will supplement the Authority's Small Business Program which has an aggressive 30 percent goal for small business participation, which includes goals of 10 percent for disadvantaged business enterprises and 3 percent for disabled veteran business enterprises.

- The nature and extent of the compensation available to displaced individuals, businesses, and non-profits needs to be reevaluated and increased as necessary to amounts that will fully compensate for all actual costs associated with the displacement or relocation (Vol. V, City of Fresno comment).

Economic and social impacts are not environmental impacts necessitating mitigation under CEQA. Nevertheless, the Authority finds that this comment is word-for-word identical to the City of Fresno's comment 703-16 on the Merced Fresno Draft EIR/EIS (Authority and FRA Volume IV April 2012). The Merced Fresno EIR/EIS was revised based on the city's recommendations regarding Mitigation Measure SO-MM#2 (Authority and FRA Volume 1 April 2012, pages 3.12-67 – 3.12-68). The Fresno Bakersfield Revised DEIR/Supplemental DEIS incorporated what was the mitigation measure for the Merced Fresno project into Section 3.12.6, "Project Design Features" (see pages 3.12-116 and 3.12-117). The city's recommendations are satisfied by the project design features, which ensure that the relocation plan is written in consultation with cities and counties including the City of Fresno to meet specified objectives. The plan will be prepared before any acquisitions occur. As the city is aware, the Authority and the city have been in discussions to come to terms with a right-of-way acquisition agreement which implements the suggestions in this comment and provides the means for the city and Fresno County to assist with the relocation of businesses.

- Authority should assist businesses through the permitting process at their new site and ensure that the necessary infrastructure is in place, entitlements exist for the business, and additional funds above and beyond the typical compensation, including loan assistance (Vol. IV, City of Bakersfield Planning Division comment).

Economic and social impacts are not environmental impacts necessitating mitigation under CEQA. Nevertheless, as explained in the EIR/EIS, relocation assistance provided under the Uniform Act includes assistance in finding replacement properties, moving expenses, and obtaining permits. The costs associated with obtaining special permits or other development entitlements are not subject to the \$10,000 cap on reestablishments expenses, as they will be reimbursed for the full cost.

Mitigation Measure SO-MM#4 describes the measures that will be implemented to reduce the impacts associated with relocating important community facilities. For more information on the property acquisition and compensation process see Volume II Technical Appendix 3.12-A.

Measure Addresses Impacts that are Less than Significant. The following mitigation measures were not adopted because impacts associated with displacement will be less than significant with implementation of the project's mitigation measures and because impacts associated with HST operation-related property and sales tax revenue effects would be less than significant.

- Requesting that the compensation exceeds Uniform Act and CRAA compensation caps to amount that will fully compensate for all actual costs associated with the displacement or relocation (Vol. IV, City of Fresno comment).

Economic and social impacts are not environmental impacts necessitating mitigation under CEQA. The Final EIR/EIS concluded that after mitigation, the project would not result in any significant and unavoidable effects related to displacement and relocation. Therefore, no changes to the mitigation measures are necessary. Furthermore, it should be noted that the limits for reimbursement caps are set by the Uniform Act, thus, they can only be changed by legislation. The \$10,000 cap on reestablishment expenses cited include, but are not limited to things such as repairs or improvements to the replacement real property; modifications to the replacement property; and construction and installation costs for exterior signing. Nevertheless, an increase in the cap is not needed to reduce displacement impacts to less-than-significant levels.

Costs associated with obtaining special permits or other development entitlements are addressed in the Caltrans right-of-way manual, Section 10.05.05.10. The Authority has adopted this manual for use until such time as the Authority creates its own right-of-way manual. This section states

that "The displacee is entitled to the cost of any license, permit, or certification required for the particular business or organization to operate at the replacement location that is not transferable to the replacement property..."

- Economic impacts to businesses, sales tax and property tax need to be not only analyzed in greater depth, but also mitigated in part through the creation of a Business Relocation Team. This team needs to be funded by the Authority and would include working with community partners to assist impacted businesses find a new location as well as assist the City in processing new site plans, permits and all necessary steps to get them up and running as quickly as possible in their new location (Vol. IV, City of Fresno comment).

As described in the Final EIR/EIS, Volume I, Section 3.12, SO Impact # 3, SO Impact #4, and SO Impact #13, the intensity of the effect is negligible for all alternatives, including the Preferred Alternative north of 7th Standard Road, because the economic impact is measurable, but would not be perceptible to community residents.

The Authority is and has been working in conjunction with the City of Fresno and County of Fresno to develop resources to assist impacted businesses and to mitigate any potential impacts on city and county staff and resources for the increased permitting needs of those impacted businesses. The Authority has committed to maintain a "permit bureau" to help businesses overcome the regulatory disruptions caused by the project.

- Requesting that the Authority fund a business relocation team in Fresno (Vol. IV, City of Fresno comment).

As described in the Final EIR/EIS, Volume I, Section 3.12, SO Impact #3, SO Impact #4, and SO Impact #13, the intensity of the effect is negligible for all alternatives, including the Preferred Alternative north of 7th Standard Road, because the economic impact is measurable, but would not be perceptible to community residents.

Furthermore, the Authority has committed to maintain a "permit bureau" to help businesses overcome the regulatory disruptions caused by the project.

Section 3.15, Parks and Recreation

Measure Addresses an Impact that is Less than Significant. The following mitigation measures were not adopted because activities are part of the proposed project actions and impacts would be less than significant.

- The commenter suggests an underpass for foot and motor traffic, at the same place where the current entrance to the Colonel Allensworth State Historic Park is located (Vol. V, Pierro comment).

The Preferred Alternative north of 7th Standard Road includes the Allensworth Bypass, thereby avoiding any potential impacts to the Colonel Allensworth State Historic Park.

Section 3.16, Aesthetics and Visual Resources

Measures that do not represent clear improvements, from an environmental standpoint, over the draft language that the commenter seeks to replace. The following mitigation measures were not adopted because they do not offer clear environmental benefits over, the mitigation measures already incorporated and adopted by the Authority.

- City requests decorative masonry, subject to approval of the city, to be used for sound walls. EIR/EIS should identify ways to mitigate graffiti (Vol. V, City of Corcoran comment).

Locally preferred sound barrier treatments, as described in the comment, would be incorporated in accordance with AVR-MM#2a and #2g in Section 3.16, Aesthetics and Visual Resources. AVR-MM#2g: Provide Sound Barrier Treatments calls for a range of sound barrier treatments, including the use of surface enhancements and textures consistent with design features developed in consultation with local communities.

- Because of the visual prominence the viaduct heading into Bakersfield should be designed to be a central iconic landmark. If that isn't possible consider a greenfield station north or south of town (Vol. V, DeCoster comment).

This proposed mitigation measure is not relevant to the Preferred Alternative north of 7th Standard Road. In response to the suggestion, however, the Authority notes that pursuant to Mitigation Measure AVR-MM#2a, the Authority would establish a consultation and design process with affected cities and counties to advance the final design through a collaborative, context-sensitive solutions approach. Participants in the consultation process will meet on a regular basis to develop a consensus on the urban design elements that are to be incorporated into the final guideway designs.

- Modify AVR-MM#2a, AVR-MM #2b, and AVR-MM #2f to include the affected property owner in the coordination. Further, the affected property owner shall determine the actual measures to be implemented (Vol. V, Coffee-Brimhall, LLC comment).

Mitigation Measure AVR-MM#2a require the Authority to work with affected cities and counties to establish a consultation and design process with affected cities and counties to advance the final design through a collaborative, context-sensitive solutions approach. Participants in the consultation process will meet on a regular basis to develop a consensus on the urban design elements that are to be incorporated into the final guideway designs. Similarly, Mitigation Measure AVR-MM#2b requires that during the development of final design, the Authority will work with the affected cities and counties to develop a project site and landscape design plan for the areas disturbed by the project. The landscaping implemented pursuant to Mitigation Measure AVR-MM#2f will be consistent with the landscape design plan developed in consultation with the affected cities and counties per Mitigation Measure AVR-MM#2b. Nothing about Mitigation Measures AVR-MM#2a and AVR-MM#2b preclude affected landowners from participating in the design processes established by those mitigation measures. The measures provide flexibility to ensure that all interested persons will be able to participate in the final design process, while not requiring that any one individual participate in the process. This degree of flexibility offers benefits in terms of implementing the mitigation measure that are not offered in the measure suggested by the commenter.

- Apply AVR-MM #2a, Action Bullet 5, to elevated guideways (Vol. V, Coffee-Brimhall, LLC comment).

AVR-MM#2a, Action Bullet 5 already applies to elevated guideways, as well as other areas. No changes to the mitigation measure are warranted.

- Analyze construction and engineering techniques that would reduce construction noise and excavation impacts on adjacent properties, and to preserve existing vegetation and/or provide extensive new mitigation screening (Vol. V, City of Wasco comment).

Mitigation Measures AVR-MM#2b, AVR-MM#2c, AVR-MM#2d, AVR-MM#2e, and AVR-MM#2f each provide descriptions of measures that would be applied to minimize vegetation removal and provide new landscape screening. Mitigation Measure N&V-MM#1 requires a noise monitoring program that will ensure construction noise does not exceed the FTA's construction noise limits.

- Address impacts of widened rail right-of-way, grade separations, construction on existing trees/vegetation, and outline mitigation to minimize impacts, including extensive landscaping to screen HST facilities as much as possible (Vol. V, City of Wasco comment).

Mitigation Measure AVR-MM#2c calls specifically for extensive landscape screening adjacent to affected residential areas. Furthermore, Mitigation Measures AVR-MM#2b, #2d, #2e, and #2f each provides measures for landscape screening as required to mitigate different situations. AVR-MM#2c calls for the Authority to work with affected cities to develop site and landscape plans for areas disturbed by the project. These measures are therefore consistent with the commenter's recommendations and the commenter's recommendations do not offer any clear environmental benefits over the adopted mitigation measures.

Measure Addresses an Impact that is Less than Significant. The following mitigation measure was not adopted because HST operation-related property and sales tax revenue effects would be less than significant.

- An underpass should be constructed at Ventura Street/UPRR/HST crossing because the overpass is problematic in terms of street connectivity, circulation, Americans with Disability Act compliance, aesthetics, and would create a barrier between communities (Vol. V, City of Fresno comment).

The EIR/EIS concluded that the effects of an overcrossing at Ventura Street would be considerably less than at Tulare Street, because of the comparative absence of high-sensitivity receptors such as the stadium entrance, SP Depot, or Fulton Mall, which terminates two blocks north of Ventura Avenue. Thus, from an aesthetic perspective, the impacts of a Ventura Avenue overcrossing would not be comparable to a Tulare Street overcrossing due to a relative absence of high-sensitivity receptors.

Section 3.18, Regional Growth

Measures that do not represent clear improvements, from an environmental standpoint, over the draft language that the commenter seeks to replace. The following mitigation measures were not adopted because they are similar to, and otherwise do not offer clear environmental benefits over, the mitigation measures already incorporated and adopted by the Authority.

- The Authority and FRA should identify all measures within their control to minimize potentially adverse impacts from HST induced changes to growth patterns.
 - For station-cities, include commitments for partnerships and for providing grant funding to promote comprehensive station area planning, so that local stakeholders have the tools to maximize economic, community and environmental benefits from the project.
 - For the urban edges of station-cities and neighboring communities, identify measures to prevent unplanned HST induced growth. These could include commitments for partnering with state agencies, regional planning organizations, or local governments to evaluate whether counties and key non-station cities need technical assistance in planning for HST and help connect them to available resources and tools.
 - For agricultural lands in areas most at risk of experiencing HST induced development pressures, commit to promote placement of conservation easements.
 - To increase transit access to HST, commit in the FEIS to partner with local and regional transit providers to develop connectivity plans and implement measures to increase transit access to HST (Vol. V, U.S. Environmental Protection Agency comment).

Bullet 1: The Authority has offered grants to station cities for station planning. Station planning will incorporate the Authority's March 2011 Urban Design Guidelines: California High-Speed Train Project, which promotes connectivity with the areas adjoining the stations and compact development within those areas (Authority 2011).

Bullet 2: The Authority has no jurisdiction over the urban edges, so its ability to ensure that cities and counties do not approve unplanned growth in the future is very limited. However, the cities and counties are participating in the regional agencies' ongoing Senate Bill (SB) 375 planning processes. The resultant "sustainable communities' strategies" adopted by the council of governments in each county is expected to achieve the objective of reducing additional unplanned growth and sprawl in the region through targeted transportation spending, housing needs allocations, and CEQA streamlining incentives for compact growth.

Bullet 3: The Authority has committed to funding conservation easements through the Department of Conservation's California Farmland Conservancy Program (see Mitigation Measure Ag-MM#1: Preserve the Total Amount of Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland in Section 3.14, Agricultural Lands, of the EIR/EIS). The selection criteria will place a higher priority on lands that can serve as urban separators or that are under development pressure. The existing mitigation measure is sufficient.

Bullet 4: The Authority has committed to working with local and regional transit providers through the "blended approach" described in the April 2012 Revised 2012 Business Plan for the California HST System (Authority 2012d). Further, the HST stations will be designed as multi-modal facilities to include easy connections to local transit service (see Section 2.4.4, Station Alternatives). This commitment is reflected in the March 2011 Urban Design Guidelines (Authority 2011), which describe provisions within station area design to connect to local transit.

Section 3.19, Cumulative Impacts

Measures that do not represent clear improvements, from an environmental standpoint, over the draft language that the commenter seeks to replace. The following mitigation measure was not adopted because it is similar to, and does not otherwise offer clear environmental benefits over, the mitigation measures already incorporated and adopted by the Authority.

- Purchase and set aside offsetting lands in a farmland trust, a measure that has been required of other related state projects.

This mitigation measures is essentially the same as AG-MM#1, which will permanently preserve Important Farmlands for agricultural uses. With the California Farmland Conservancy, the Authority anticipates working with local, regional, and state organizations and agencies to identify suitable land in the region and willing landowners to establish agricultural conservation easements on an acre-for-acre basis, ensuring permanent protection and long-term stewardship for working agricultural lands. AG-MM# 1 also contains performance standards to ensure a measurable accomplishment of the mitigation.

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7.0 Statement of Overriding Considerations

The Final Project EIR/EIS and the CEQA Findings of Fact conclude that implementing the portion of the Preferred Alternative north of 7th Standard Road in Kern County, as part of the statewide high-speed train system (see section 2 above), will result in certain significant impacts to the environment that cannot be avoided or substantially lessened with the application of feasible mitigation measures or feasible alternatives. This Statement of Overriding Considerations is therefore necessary to comply with CEQA, Public Resources Code, Section 21081, and the State CEQA Guidelines, Section 15093. The significant and unavoidable impacts and the benefits related to the Preferred Alternative north of 7th Standard Road are described below. The Authority Board has carefully weighed these impacts and benefits and finds that the benefits of implementing the portion of the Preferred Alternative north of 7th Standard Road outweigh the significant and unavoidable environmental impacts.

7.1 General Findings on Significant and Unavoidable Impacts Associated with the Preferred Alternative North of 7th Standard Road

Based upon the Final Project EIR/EIS and the CEQA Findings of Fact contained herein, as well as the evidentiary materials supporting these documents, the Authority finds that implementing the portion of the Preferred Alternative north of 7th Standard Road could result in the following list of significant and unavoidable impacts to the environment:

Noise and Vibration

- N&V IMPACT #3 – Project Noise Impacts

Socioeconomics, Communities, and Environmental Justice

- SO IMPACT #7 – Division of existing community Ponderosa Road/Edna Way east of Hanford, the Newark Avenue vicinity northeast of Corcoran, and Crome

Station Planning, Land Use, and Development

- LU IMPACT #2 – Permanent Conversion of Existing Land Uses to Transportation Use
- LU IMPACT #3 – Land Use Effects of Parking Demand at Kings/Tulare Regional Station East
- LU IMPACT #4 – Indirect Effects on Surrounding Land Uses at Kings/Tulare Regional Station East
- LU IMPACT #5 – Potential for Future Increased Density and TOD Development at Kings/Tulare Regional Station East

Agricultural Lands

- AG IMPACT #1 – Permanent Conversion of Agricultural Land to Non-agricultural Use

Aesthetics and Visual Resources

- AVR IMPACT #4 – Lower Visual Quality in the Rural Valley/Agricultural Landscape Unit
- AVR IMPACT #4 – Lower Visual Quality in Corcoran, Wasco, and Shafter Landscape Units
- AVR IMPACT #4 – Sound Barriers would lower visual quality or block views

Cultural and Paleontological Resources

- CUL IMPACT #2 – Potential Adverse Effects on Historic Architectural Resources due to Construction Activities

Cumulative Impacts

- The Preferred Alternative's contribution to cumulatively considerable noise impacts would be cumulatively considerable because of the size of the HST construction project relative to other development that may occur adjacent to the Preferred Alternative.
- The Preferred Alternative's noise impacts, together with noise impacts of past, present, and reasonably foreseeable projects adjacent to transportation corridors would cause a cumulatively considerable noise impact. Because of the large number of sensitive receivers along transportation corridors the project contribution to the noise impact would be cumulatively considerable.
- The Preferred Alternative's contribution during construction of the Preferred Alternative and during operations to impacts on communities from division and/or disruption by the linear infrastructure would be a cumulatively considerable
- During operations, the Preferred Alternative's contribution to cumulative impacts on land use planning and development during operation would be cumulatively considerable because of the unplanned permanent conversion of land to transportation uses, and resulting land use incompatibilities in some locations.
- The Preferred Alternative's contribution to cumulative impacts to agricultural lands would be cumulatively considerable because of the conversion of agricultural lands to nonagricultural land uses.
- Continued urbanization and development projected under the cumulative condition could result in exposure and disruption of archaeological and paleontological resources and traditional cultural properties, and removal or damage to historic architectural resources, and would result in a cumulatively considerable impact. The Preferred Alternative's contribution to these impacts would be cumulatively considerable under CEQA.

With the approval of the Preferred Alternative north of 7th Standard Road and the adoption of the CEQA Findings of Fact, the Authority is committing to implement the mitigation measures identified for this portion of the Preferred Alternative to ensure that significant impacts are mitigated to a less than significant level to the extent feasible, and that the project's contribution to cumulative impacts is minimized and mitigated to the extent feasible. The Authority finds that the mitigation measures adopted with the findings are the appropriate measures to approve at this time because they apply to the Preferred Alternative north of 7th Standard Road. The Board does not have to legally, so does not, make findings about impacts and mitigation related to the Preferred Alignment south of 7th Standard Road because the Board is not approving at this time any alignment south of 7th Standard Road. However, the Board recognizes and incorporates by reference the impacts and mitigation detailed in the Final EIR/S related to the alignment alternatives south of 7th Standard Road and concludes that any of those impacts that would be significant and unavoidable also are outweighed by the reasons in this Statement of Overriding Considerations. The Board would make actual findings, and overriding conditions as if/then necessary and relevant, about an alignment south of 7th Standard Road when the Board approves an alignment south of 7th Standard Road.

The Authority further finds that while the mitigation measures it adopts as part of the CEQA Findings of Fact will substantially lessen or avoid many of the significant environmental impacts

discussed in the Final Project EIR/EIS, and mitigation adopted to address one area may result in beneficial effects in other subject areas, the above impacts will not all be mitigated to a less than significant level, and remain significant and unavoidable.

The Authority finds that each of the following specific economic, legal, social, technological, environmental and other considerations and benefits of the Preferred Alternative, separately and independently, outweigh the unavoidable adverse environmental effects of the project, and each one is an overriding consideration independently warranting project approval. The Authority finds that the significant unavoidable impacts of the project are overridden by each of these individual considerations, standing alone. The significant unavoidable environmental effects remaining after adoption of mitigation measures are considered acceptable in light of these significant benefits of the Preferred Alternative, as described in this statement of overriding considerations.

7.2 Overriding Considerations for the Preferred Alternative, the Portion of the Preferred Alternative North of 7th Standard Road, and the High-Speed Train System

There are numerous benefits of the Preferred Alternative, and the portion of the Preferred Alternative north of 7th Standard Road. In addition, there are numerous benefits of the HST System as a whole, of which the Fresno to Bakersfield section is an integral part. These benefits viewed both individually and collectively, outweigh the significant and unavoidable adverse effects of implementing the portion of the Preferred Alternative north of 7th Standard Road. These benefits are in the areas of transportation, the environment, land use planning, economics, and social considerations, and are set forth below.

7.2.1 Benefits of the Preferred Alternative as a Whole and the Portion of the Preferred Alternative North of 7th Standard Road

The Preferred Alternative and the portion of the Preferred Alternative north of 7th Standard Road, have numerous benefits that outweigh the unavoidable adverse impacts in the Fresno to Bakersfield section of the high-speed train system.

7.2.1.1 Provides the First Test Track in the United States for Testing Very High Speed Train Vehicles

A benefit from the portion of the Preferred Alternative north of 7th Standard Road is that this stretch of track alignment will form the high-speed train test track, which is an essential prerequisite to electrified, high-speed rail revenue service. The high-speed train system requires a test track between 80 and 105 miles long, in a fairly flat and straight alignment, to allow for testing and commissioning of very high-speed rolling stock at speeds of 220 mph (Final EIR/EIS, pp. 2-16 to 17). This test track will be the first of its kind in the nation and will provide for testing and commissioning rolling stock at multiple speeds for California's high-speed train system. No other existing facility in the United States is capable of being used for this purpose. The portion of the Preferred Alternative north of 7th Standard Road, are an essential component of the alignment needed for testing and certifying trains, and therefore the alignment is a valuable infrastructure asset for achieving the Authority's objectives of very high-speed electrified passenger rail service, independent of subsequent transportation uses of the system or the timing of such subsequent transportation uses.

7.2.1.2 Provides an Essential Building Block to Establish Very High-Speed Passenger Service

Another related benefit from the Preferred Alternative as a whole, and from the portion of the Preferred Alternative north of 7th Standard Road, is that this piece of the high-speed train system provides the essential back-bone of the system in the Central Valley, from which the remainder of the system can continue to be planned, environmentally evaluated, and eventually constructed and operated. As described in the 2012 and 2014 Business Plans, and as recognized by the Federal Railroad Administration in its award of American Recovery and Reinvestment Act and FY 2010 funds for Central Valley construction, the high-speed train system is logically planned to start construction in the Central Valley, because the Central Valley forms the foundation of the system. Construction will proceed incrementally to establish an Initial Operating Section that will allow for the earliest possible very-high-speed revenue passenger service in compliance with applicable laws. As a very large linear infrastructure project, the roughly 800 mile statewide system, or even the roughly 540 miles Phase 1 of the system between San Francisco and Los Angeles, cannot feasibly be planned, environmentally reviewed, constructed, and be ready for operation all at once. Construction must begin somewhere, and the Fresno to Bakersfield section of the system provides a benefit of serving as a critical foundation of the system, without which the remainder of the system would not be built and made operational as efficiently.

7.2.1.3 Provides a Valuable Transportation Asset for Potential Use By Conventional Rail

Another benefit of the portion of the Preferred Alternative north of 7th Standard Road is the availability of the new passenger rail track for conventional passenger rail use on an interim basis. Although the Authority has jurisdiction over high-speed passenger rail, rather than conventional passenger rail, the 2012 Business Plan identified the potential for the initial construction in the Central Valley to provide immediate passenger rail benefits by being available for use by a conventional passenger rail provider such as Amtrak. The portion of the Preferred Alternative extending to 7th Standard Road in Kern County, in combination with the already approved portion of the Merced to Fresno section, will be available upon completion of construction for this immediate transportation benefit, should a provider seek to put it to use. This roughly 126 miles of track in the Central Valley would offer passenger transportation benefits in the form of faster travel times and improved reliability due to it being fully separated from freight rail tracks. It may not be necessary or appropriate to allow for such interim use depending on future factors and the Authority is not approving such use in these Findings. However, if such interim use is ever approved and implemented, then the Preferred Alternative north of 7th Standard Road would serve to provide a valuable transportation asset and benefit for either short or long-term conventional rail use, irrespective of further high-speed train system construction or ability to use the track for electrified passenger rail service.

7.2.1.4 Provides Economic and Employment Benefits from Construction

Construction of the Preferred Alternative for the Fresno to Bakersfield section as a whole would generate sales tax revenue gains for the region over the construction period that have been estimated at about \$11.2 million for the four counties: \$5.6 million for Fresno County, \$520,000 for Kings County, \$2.2 million for Tulare County, and \$2.8 million for Kern County. These sales tax revenue gains would increase local government revenues during the construction period and provide an economic benefit.

Employment from construction of the Preferred Alternative for the Fresno to Bakersfield section as a whole would provide employment benefits in the region. It is estimated that about 22,800 one-year, full-time job equivalents would be created within Fresno, Kings, Tulare, and Kern counties over the construction period. Direct jobs in the construction sector comprise about 33%

of the total estimate, or about 7,600 one-year, full-time job equivalents. Job creation is anticipated to be highest during peak construction years of 2015-2018, requiring about 4,750 workers annually, with about 1,600 of these as direct jobs in the construction sector and about 3,150 as indirect and induced jobs in other sectors. The provision of new construction and non-construction job opportunities over the construction period in the San Joaquin Valley, which has suffered very high unemployment during the recent recession, particularly in the construction sector, is an important project benefit.

For the portion of the Preferred Alternative north of 7th Standard Road, the anticipated benefits listed above would be somewhat less due to not carrying construction into Bakersfield at this time. The benefits are still positive and are anticipated to be about 94% of the sales tax revenue gains and 92% of the employment gains described above.

In addition, estimates prepared for the 2014 Business Plan indicate substantial, positive fiscal impacts from construction of the ICS, the majority of which is the Preferred Alternative north of 7th Standard Road. The estimates include a more than \$ 8 billion increase in net GDP, but also a more than 3 to 1 return in GDP for the state's share of the funds to construct the ICS, which is funded in part by federal grants (Authority 2012f, p. 60).

7.2.1.5 Summary of Benefits of Preferred Alternative as a Whole and Portion of Preferred Alternative North of 7th Standard Road

In summary, the Authority finds that there are benefits associated with the Preferred Alternative as a whole, and with just the portion of the Preferred Alternative north of 7th Standard Road in Kern County, that will occur independently of any other construction of the high-speed train system. The Authority further finds that the portion of the Preferred Alternative north of 7th Standard Road offers benefits in conjunction with the already-approved portion of the Merced to Fresno section of the high-speed train system, but without any other construction of the high-speed train system to the north or south. Each of these benefits individually, as well as in combination, are sufficient overriding considerations that outweigh the significant and unavoidable environmental impacts of implementing the Preferred Alternative and the portion of the Preferred Alternative north of 7th Standard Road.

7.2.2 Benefits of the Fresno to Bakersfield Section as Part of the Statewide High-Speed Train System

The Preferred Alternative, and the portion of the Preferred Alternative north of 7th Standard Road in Kern County, also have numerous benefits that outweigh the unavoidable adverse impacts in the Fresno to Bakersfield section of the high-speed train system when viewed as part of the larger, statewide high-speed train system. These benefits are documented in the Final Project EIR/EIS in the areas of transportation, air quality, energy, land use, and socio-economics and are appropriate to consider in light of the Authority's first-tier decisions to move forward with a statewide electrified high-speed train system.

The Final EIR/EIS considers for environmental review purposes a scenario in which the 800-mile Full System (Phase 1 and Phase 2 full build out) would be operating and generating benefits in 2035. The level of benefits is more robust as of 2035 than the level of benefits associated with the implementation strategy laid out in the Authority's 2012 and 2014 Business Plans, which reflect an incremental approach to constructing and operating the system that would result in benefits accruing more slowly than described in Final EIR/EIS chapter 3. The differences are summarized in Final EIR/EIS Appendix 1A, and acknowledged below.

7.2.2.1 Transportation Benefits

The capacity of California's intercity transportation system is insufficient to meet existing and future demand and the current and project future congestion of the system will continue to result in deteriorating transportation conditions, reduced reliability, and increased travel times. The system has not kept pace with the tremendous increase in population, economic activity, and tourism in California. The interstate highway system, commercial airports, and conventional passenger rail system serving the intercity travel market are operating at or near capacity and will require large public investments for maintenance and expansion to meet existing demand and future growth over the next 20 years and beyond. Moreover, the ability to expand major highways and key airports is uncertain; some needed expansions may be impractical or may be constrained by physical, political, or other factors.

As described in the Chapter 1 of the Fresno to Bakersfield Final EIR/EIS, the HST System would meet the need for a safe and reliable mode of travel that would link the major metropolitan areas of the state and deliver predictable, consistent travel times sustainable over time. The HST System also would provide quick, competitive travel times between California's major intercity markets. For intermediate intercity trips such as Fresno to Los Angeles, the HST System would provide considerably quicker travel times than either air or automobile transportation, and would bring frequent HST service to portions of the state such as the Central Valley that are not well served by air transportation. In addition, the passenger cost for travel via the HST service would be lower than for travel by air for the same intercity markets.

By providing a new intercity, interregional, and regional passenger mode, the HST System will improve connectivity and accessibility to other existing transit modes and airports. Travel options available in the Central Valley and other areas of the state with limited bus, rail, and air service for intercity trips will be improved. The HST System within the Central Valley would provide beneficial transportation impacts beyond additional modal connectivity. The change from vehicles to HST would reduce daily auto trips and corresponding vehicle delay and congestion. A substantial amount of intercity auto travel (primarily using SR 99) would divert to HST service, relieving projected future congestion on SR 99. The reduction in future intercity trips would also improve the ability of SR 99 to accommodate freight traffic and would improve projected travel speeds on the freeway. The HST System also provides system redundancy in cases of extreme events such as adverse weather or petroleum shortages (HST trains are powered by electricity which can be generated from non-petroleum-fueled sources; automobiles and airplanes currently require petroleum). The HST System will provide a predominantly separate transportation system that will be less susceptible to many factors influencing reliability, such as capacity constraints, congestion, and incidents that disrupt service.

The HST System will add capacity to the state's transportation infrastructure and reduce traffic on certain intercity highways and around airports to the extent that intercity trips are diverted to the HST System. Diversions from the automobile to HST could lead to a projected 7% to 10% reduction in vehicles miles traveled on the highway system to and from the Fresno/Bakersfield region (7% if based on a ticket price of 83% of airfare cost, or 10% if based on a ticket price of 50% of air fare cost). This translates to a reduction in daily VMT in Fresno, Kings, Tulare, and Kern counties of 5.4 to 8 million miles daily in 2035 as compared to No Project. The HST System also will decrease injuries and fatalities due to diversion of trips from highways, will improve connectivity, and will add a variety of connections to existing modes, additional frequencies, and greater flexibility.

The HST System within the Central Valley would provide a new regional surface transportation system that complements and connects with existing transportation modes. At a regional level, HST service would reduce vehicle miles traveled by providing motorists an alternative to relying on existing interregional and intercity freeways and highways. The HST System would be grade-

separated from freeways, highways, and roads, allowing vehicular traffic to pass unimpeded under or over the rail corridor.

The State's growing population, and the growing demand on the State's transportation system, was the early impetus for high-speed rail in California. The same trends that motivated the State to investigate, support, and proceed to plan the high-speed rail system are just as compelling today as in the last two decades. The State's need for a safe, reliable, and fast mode of intercity travel to meet its growing transportation demands continues to a critical policy basis for moving the project forward (Authority, 2012f, pp. 16-18).

7.2.2.2 Environmental Benefits

In addition to reducing highway congestion, the HST System as a whole will provide substantial improvement in air quality and transportation energy efficiency. The HST System will decrease air pollution statewide and in all air basins analyzed by reducing pollution generated by automobile combustion engines; air pollution is of particular concern in the San Joaquin Valley, which will benefit greatly from operation of the HST. This is a result of decreased vehicle miles traveled by automobiles and decreased automobile congestion. Emissions of CO, PM₁₀, PM_{2.5}, NO_x, VOC, and CO₂ will all be reduced as compared to the No Project Alternative in 2035. Compared to the No Project scenario, the HST System will result in a reduction in transportation energy consumed of 63,262 to 94,760 MMBtus daily. 12.7 million barrels of oil by 2035 and 1.7 to 2.5 million metric tons per year of CO₂ emissions compared to the No Project Alternative, by 2035, helping the state reduce GHG emissions consistent with the goals of Assembly Bill 32 (AB 32) and Executive Order S-3-05. The Central Valley contribution to this reduction would be up to 0.56 million metric tons (1.2 billion pounds) of GHG emissions annually by 2035 for the Preferred Alternative.

The statewide HST System has minimized environmental impacts following existing transportation corridors to the maximum extent feasible. The preferred alignment and stations locations for the system as a whole have been crafted to avoid and/or minimize the potential impacts to cultural, park, recreational and wildlife refuges to the greatest extent feasible in light of the project's objectives. In this way, the HST System meets the purpose and need and project objectives for improving the state's transportation options, while doing so in an environmentally sensitive way.

The USACE and the U.S. EPA have both concurred (USACE December 19, 2013 and U.S. EPA December 19, 2013) that the Preferred Alternative north of 7th Standard Road is the preliminary Least Environmentally Damaging Practicable Alternative (LEDPA). For this reason, the Preferred Alternative north of 7th Standard Road is the alternative for the Fresno to Bakersfield Section that will have the highest likelihood of being efficiently constructed and operated.

7.2.2.3 Consistency with State Policies in Executive Order S-3-05, Assembly Bill 32 and Senate Bill 375

In 2005, California set statewide targets for reducing GHG emissions. Executive Order S-3-05 requires that GHG emissions be reduced to 2000 levels by the year 2010, to 1990 levels by the year 2020, and 80% below 1990 levels by the year 2050. Shortly after the issuance of this executive order, the California State Legislature passed AB 32, the Global Warming Solutions Act of 2006. AB 32 recognizes that California is the source of substantial amounts of GHG emissions and that global climate change poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. AB 32 requires that the California Air Resources Board (CARB), the state agency charged with regulating air quality, establish a statewide greenhouse gas emissions limit to be achieved by 2020, with the intent that the emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gasses beyond 2020. AB 32 also requires that CARB create a plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases" in

California. This plan was developed by CARB in 2008 as the Climate Change Scoping Plan (California Air Resources Board 2008), the state's road map to reaching the GHG reduction goals required by AB 32. The Plan supports the implementation of a High-Speed Rail System to provide more mobility choice and reduce GHG emissions. The "Approved Scoping Plan" was adopted by the CARB in December 2008 and reapproved by the CARB in August 2011 after additional alternatives analysis was added in response to litigation.

Adopted in September 2008, Senate Bill 375 (SB 375) provides a new planning process to coordinate community development and land use planning with Regional Transportation Plans (RTPs), in an effort to reduce sprawling land use patterns, and thereby reduce VMT and associated VMT. SB 375 is one major tool being utilized to meet the AB 32 goals. SB 375 sets priorities to help California meet GHG reduction goals and requires that RTPs prepared by MPOs include a "sustainable communities strategy" that supports the GHG emission reduction targets set by CARB. The first SCS document(s) for the Central Valley are not required to be completed as of 2012. However, because of the potential for increased TOD-type development and other land-use planning benefits (discussed below) in the Fresno and Bakersfield areas from HST implementation there, the HST will be supportive of the SCS document(s) by providing a HST as a transportation opportunity with its associated benefits to land use patterns, which will can the SCS document(s) meet SB 375 GHG reduction targets. By way of analogy, the SCS recently completed by Southern California Association of Governments (SCAG) includes Phase 1 of the California HST, and therefore includes the analysis performed to demonstrate that SCAG's RTP/SCS meets the greenhouse gas emission reduction targets set by the Air Resources Board per the requirements of SB 375.

The transportation sector is responsible for about 40% of California's GHG emissions (California Air Resources Board 2010). Emissions of criteria pollutants (carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide) and GHG emissions from motor vehicles are directly related to the amount of fuel burned and affect air quality in the San Joaquin Valley. The San Joaquin Valley Air Basin exceeds federal and state air quality standards for ozone, PM_{2.5}, and for the state's 24-hour standard for PM₁₀. The projected population growth (see Section 3.19, Regional Growth) in the San Joaquin Valley will result in an increase in VMT (see Section 3.2, Transportation) and the volume of pollutants emitted by motor vehicles. The continued increase in traffic will exacerbate the existing air quality problem and impede the region's ability to attain state and federal ambient air quality standards. Because emissions are directly proportional to the amount of fuel burned, offering effective transportation choices that can reduce driving will be critical for reducing these emissions.

Compared to travel by car, an electric-powered HST System would reduce carbon dioxide (CO₂) emissions. The HST System would provide a more energy-efficient travel mode; a trip on the HST System would use one-third the energy of a similar trip by air, and one-fifth the energy of a trip made by car (Bay Area Council Economic Institute 2008). In addition, the HST System affords a new opportunity to serve as the backbone of a comprehensive transportation network with connectivity between the statewide, regional, and local transit systems. Providing an interconnected network of alternative transportation options that support more concentrated development around major transit access points, establishes a new framework for the state to integrate land use and transportation decision-making.

7.2.2.4 Land Use Planning Benefits

In the vicinity of HST stations, the HST System will generally be compatible with local, regional, and state plans and policies that support rail systems, including the HST, and transit-oriented development (TOD). It will offer opportunities for increased infill development and redevelopment of downtown centers, which would reduce pressures for conversion of surrounding agricultural land to non-agricultural uses. The HST System will promote transit-

oriented, higher-density development around transit nodes as the key to stimulate in-fill development that makes more efficient use of land and resources, can better sustain population growth, and reduce development pressures on the surrounding agricultural lands. The increased density of development in and around urban HST stations yields the additional public benefit of making public infrastructure improvements more cost-effective. The HST stations in Fresno and Bakersfield would create a beneficial change in visual character when viewed from adjacent downtown locations. The indirect effects of the project would be most noticeable at the HST stations and are expected to result in an overall increase in visual quality (Section 3.16). Additionally, the HST System is expected to be a catalyst for wider adoption of smart growth principles in communities near HST stations.

The HST System will also meet the need for improved inter-modal connectivity with existing local and commuter transit systems. HST stations in California will be multi-modal transportation hubs. The concept of the HST station as a transportation hub is also consistent with the Revised 2012 Business Plan, the primary difference being a lower level of ridership projected during the early years on implementation and operation. All the selected high-speed rail station locations will provide linkage with local and regional transit, airports, and highways. In particular, convenient links to other rail services (heavy rail, commuter rail, light rail, and conventional intercity) will promote TOD at stations by increasing ridership and pedestrian activity at these "hub" stations. A high level of accessibility and activity at the stations can make the nearby area more attractive for additional economic activity. Most of the potential stations identified for further evaluation at the project level are located in the heart of the downtown/central city areas of California's major cities, minimizing potential impacts on the environment and maximizing connectivity with other modes of transportation.

7.2.2.5 Economic and Social Benefits

The HST System will generate economic benefits related to revenue generated by the system, economic growth and jobs generated by construction and operation of the system, benefits from reduced delays to air and auto travelers, and economic advantages related to proximity to the HST System.

Construction of the HST System will generate the equivalent of more than 1 million construction related job years for construction of the blended Phase 1 HST System (Authority 2012d, page 9-12; Authority 2012f, p. 59), including about 22,800 job years within Fresno, Kings, Tulare, and Kern counties. Operations and maintenance of the HST System would directly employ about 3,400 people by 2040 (Authority 2012f, p. 60), and the potential statewide creation of about 400,000 long-term permanent jobs. Operation of the HST System is estimated to create approximately 1,300-3,400 direct jobs (Authority 2012d and 2012f), and overall about 47,500 new jobs within the region. In addition, the HST System would improve the economic productivity of workers engaging in intercity travel by providing an option to avoid the delays and unpredictability associated with air and highway travel. These economic benefits are in marked contrast to the cost of expanding airports and highways, which would be approximately twice the cost of the HST System to meet the future transportation demand, even assuming this type of expansion is even feasible (Authority 2012d, page 3-15).

Experiences in other countries have shown that an HST System can provide a location advantage to those areas in proximity to an HST station because an HST System would improve accessibility to labor and customer markets, potentially improving the competitiveness of the state's industries and the overall economy. Businesses that locate in proximity to an HST station could operate more efficiently than businesses that locate elsewhere (Section 3.13). This competitive advantage may be quite pronounced in high-wage employment sectors that are frequently in high demand in many communities. Finally, the HST System would provide an opportunity for connectivity for sectors of the population who currently are limited in their travel options. In addition, HST is a

mode of transportation that can enhance and strengthen urban centers. In combination with appropriate local land use policies, the increased accessibility afforded by the high-speed service could encourage more intensive development and may lead to higher property values around stations.

7.2.2.6 Benefits Will Accrue More Slowly Under The Phased Implementation Approach in the Authority's Business Plans, But Will Still be Significant Benefits and They Will Build Over Time

The Authority's 2012 and 2014 Business Plans describe a phased implementation strategy for construction of the HST System. In contrast to the assumptions in the Final EIR/EIS, the Business Plans identify the HST System being constructed in phases over time, rather than having all 800 miles of the statewide system being constructed concurrently and with fully developed operations in 2035. Because the system will be constructed and implemented more slowly over time than assumed in the Final EIR/EIS, benefits of the system will also accrue more slowly over time than calculated in the Final EIR/EIS. Statewide automobile VMT reductions for a Phase 1 Blended approach would be about 36-38% of the benefits described above, and air travel VMT reductions about 37-45% of that described above. The Phase 1 Blended approach would yield a GHG emissions reduction of approximately 0.84 to 1.4 million metric tons annually in 2035, in contrast to the 1.7 to 2.5 million metric tons annually as discussed for the Final EIR/EIS. Energy use benefits would be less for a Phase 1 Blended approach, totaling 31,300 to 52,000 MMBtus daily, versus the 63,262 to 94,755 MMBtus daily in 2035 described in the Final EIR/EIS. This still amounts to a savings of 5,400 to 9,000 barrels of oil per day.

Finally, the Authority has previously committed to power the high-speed train with an energy portfolio of 100% renewable sources. The Final EIR/EIS calculations of GHG reduction benefits for either the full system in 2035 or in Appendix 1A for the Phase 1 Blended approach are conservative in that they do not assume a 100% renewable portfolio. A 100% renewable energy portfolio is realistic to implement in light of available, viable sources offered by viable energy providers. The environmental benefit of powering the high-speed train with 100% renewable energy is substantial in terms of CO₂ reduction benefits. When accounting for the 100% renewable energy portfolio in emissions modeling, the results demonstrate CO₂ reductions are similar to those described in the Final EIR/EIS, despite modeling a phased implementation of the system with fewer riders. Over time, a 100% renewable portfolio has potential to double the GHG reduction benefits from high-speed train operations over a non-renewable portfolio.

In summary, although benefits of the high-speed train system in the areas of VMT reduction, GHG reduction, and reduced transportation energy use are lower than described in the Final EIR/EIS main impact analysis based on the phased implementation strategy in the Authority's Business Plans, the benefits are still significantly positive, the benefits will continue to accrue and grow over time, and they will eventually achieve the level of benefit the EIR/EIS describes. These benefits therefore still outweigh the significant and unavoidable adverse environmental impacts described in the Final EIR/EIS and CEQA Findings of Fact.

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Attachment A

Project Design Features

This attachment to the CEQA Findings of Fact and Statement of Overriding Considerations includes project design features that are incorporated into, and considered a part of, the high-speed train project described generally in Chapter 2 of the Fresno to Bakersfield Final Project EIR/EIS. These design features are organized by the Final EIR/EIS resource topic and include design features described in the EIR/EIS chapters, as modified by the Errata.

A1.0 Transportation Design Features

The Authority and FRA have considered avoidance and minimization measures consistent with the Statewide and Bay Area to Central Valley Program EIR/EIS commitments (Authority and FRA 2005, [2008] 2010). During project design and construction, the Authority and FRA would implement measures to reduce impacts on transportation. These measures are considered to be part of the project and are described in the following text.

1) Off-Street Parking for Construction-Related Vehicles. Identify adequate off-street parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the construction sites, designate a remote parking area and use a shuttle bus to transfer construction workers to the job site.

2) Maintenance of Pedestrian Access. Prepare specific construction management plans to address maintenance of pedestrian access during the construction period. Actions to limit pedestrian access would include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian rerouting at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions that may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, provide covered walkways. Pedestrian access should be maintained unless maintaining access would be unsafe for pedestrians.

3) Maintenance of Bicycle Access. Prepare specific construction management plans to address maintenance of bicycle access during the construction period. Actions to limit bicycle access would include, but not be limited to, bike lane closures or narrowing, closure or narrowing of streets that are designated bike routes, bridge closures, placement of construction-related materials within designated bike lanes or along bike routes, and other actions that may affect the mobility or safety of bicyclists during the construction period. Bicycle access will be maintained where feasible.

4) Restriction on Construction Hours. Limit construction material deliveries between 7 a.m. and 9 a.m. and between 4 p.m. and 6 p.m. on weekdays. The number of construction employees arriving or departing the site between the hours of 7 a.m. to 8:30 a.m. and 4:30 p.m. to 6 p.m. would be limited.

5) Construction Truck Routes. Deliver all construction-related equipment and materials on the appropriate truck routes. Prohibit heavy-construction vehicles from accessing the site via other routes.

6) Protection of Public Roadways during Construction. Repair any structural damage to public roadways, returning any damaged sections to their original structural condition. Survey the condition of the public roadways along truck routes providing access to the proposed project site both before construction and after construction is complete. Complete a before- and after-survey report and submit to the Authority for review, indicating the location and extent of any damage.

7) Maintenance of Public Transit Access and Routes. Coordinate with the appropriate transit jurisdiction before limiting access to public transit or limiting movement of public transit vehicles. Potential actions that would impact access to transit include, but are not limited to,

relocating or removing bus stops, limiting access to bus stops or transfer facilities, or otherwise restricting or constraining public transit operations. Public transit access and routing will be maintained where feasible.

8) Construction Transportation Plan. The design-builder will prepare a detailed Construction Transportation Plan for the purpose of minimizing the impact of construction and construction traffic on adjoining and nearby roadways. The Construction Transportation Plan will be prepared in close consultation with the pertinent city or county, and will be reviewed and approved by the Authority prior to commencing any construction activities. This plan will address, in detail, the activities to be carried out in each construction phase, with the requirement of maintaining traffic flow during peak travel periods. Such activities include, but are not limited to, the routing and scheduling of materials deliveries, materials staging and storage areas, construction employee arrival and departure schedules, employee parking locations, and temporary road closures, if any. The plan will provide traffic controls pursuant to the *California Manual on Uniform Traffic Control Devices* sections on temporary traffic controls (Caltrans 2012) and will include a traffic control plan that includes, at minimum, the following elements:

- Temporary signage to alert drivers and pedestrians to the construction zone.
- Flag persons or other methods of traffic control.
- Traffic speed limitations in the construction zone.
- Temporary road closures and provisions for alternative access during the closure.
- Detour provisions for temporary road closures. Alternating one-way traffic will be considered as an alternative to temporary closures where practical and where it would result in better traffic flow than would a detour.
- Identified routes for construction traffic.
- Provisions for safe pedestrian and bicycle passage, or convenient detour.
- Provisions to minimize access disruption to residents, businesses, customers, delivery vehicles, and buses to the extent practical. Where road closures are required during construction, limit to the hours that are least disruptive to access for the adjacent land uses.
- Provisions for farm equipment access.
- Provisions for 24-hour access by emergency vehicles.
- Safe vehicular and pedestrian access to local businesses and residences during construction. The plan will provide for scheduled transit access where construction would otherwise impede such access. Where an existing bus stop is within the work zone, the design-builder will provide a temporary bus stop at a convenient location away from where construction is occurring. Adequate measures will be taken to separate students and parents walking to and from the temporary bus stop from the construction zone.
- Advance notification to the local school district of construction activities and rigorously maintained traffic control at all school bus loading zones, to ensure the safety of school children
- Project Design Features 1-7 and 9-11.

9) Construction during Special Events. Provide a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other

special events that attract a substantial number of visitors. Mechanisms include the presence of police officers directing traffic, special event parking, use of within-the-curb parking, or shoulder lanes for through-traffic, traffic cones, and so on. Through such mechanisms, roadway capacity would be maintained.

10) Protection of Freight and Passenger Rail during Construction. Repair any structural damage to freight or public railways, and return any damaged sections to their original structural condition. If necessary, during construction, a "shoofly" track would be constructed to allow existing train lines to bypass any areas closed for construction activities. Upon completion, tracks would be opened and repaired; or new mainline track would be constructed, and the "shoofly" would be removed

11) Additional Features in the Cities of Fresno and Bakersfield. In addition to the measures listed above, the Authority will also perform the following in the cities of Fresno and Bakersfield:

- Maintain detection at signalized intersections where alignment changes or widening are necessary, in order that the traffic signal does not need to be placed on recall (fixed timing).
- Changeable message signs (CMS) will be employed to advise motorists of lane closures or detours ahead. The CMSs will be deployed seven days before the start of construction at that location.
- Where project construction would cause delays on major roadways during the construction period, the project will provide for a network of CMS locations to provide adequate driver notification. For example, construction-related delays at the railroad grade separations that lead to SR 99 interchanges will require CMS placement to the east to allow drivers to make alternate route decisions. In the case of work on Shaw Avenue, recommended placement would be a CMS at Shaw Avenue just east of SR 41 and a CMS at Shaw Avenue just east of Palm Avenue. Similar CMS usage will be required along Ashlan Avenue, Clinton Avenue, McKinley Avenue, Olive Avenue, and Belmont Avenue.
- The Authority, in conjunction with the City of Fresno Public Works Department and City of Bakersfield Public Works Department, will develop a traffic management plan for the surface transportation network to minimize potential impacts on public safety services.
- During project construction, alignment of roadways to be grade-separated and freeway overpasses to be reconstructed will be offset from the existing alignment to facilitate staged construction, wherever possible.

The Authority will also include the following measures specific to the city of Fresno:

- Clinton Avenue over SR 99 and Ashlan Avenue over the UPRR will be offset from their existing alignments to allow for the existing roadway to remain open while the new structure is being built. It is recognized by the city that this type of staging may necessitate temporary ramps to and from SR 99 during various phases of construction. Four travel lanes will be maintained from 7 a.m. to 9 a.m. and from 4 p.m. to 6 p.m. on Shaw Avenue from Cornelia to Blythe Avenue (at UPRR), on Ashlan Avenue from Parkway to Valentine Avenue (at UPRR), and on Clinton Avenue from Marks Avenue to Weber Avenue (at SR 99).
- The Veterans Boulevard overpass and construction of new alignments of Golden State Boulevard and Bullard Avenue will be completed and open to traffic prior to the closure of the Carnegie Avenue at-grade railroad crossing.

- One lane of traffic in each direction must be maintained at all times for Olive Avenue and McKinley Avenue for construction of the proposed grade separations. No full closures of these crossings will occur, with the exception of short duration closures of less than 72 hours not more than once per month.
- During any Belmont Avenue closures that are determined to be necessary, the adjacent crossings of Olive Avenue and Divisadero Street will remain open with no lane closures at the two crossings.
- Two of the three crossings will remain open at any given time at the existing railroad crossings at Divisadero, Tuolumne, and Stanislaus..

A2.0 Air Quality And Global Climate Change Design Features

The Authority and FRA have considered avoidance and minimization measures consistent with the 2005 Statewide Program EIR/EIS commitments. During project design and construction, the Authority and FRA would implement measures to reduce impacts on air quality. Applicable design standards for EMI/EMF that would be used for the project are provided in Appendix 2-D. These measures are considered to be part of the project and are summarized below:

- Trucks will be covered to reduce significant fugitive dust emissions while hauling soil and other similar material.
- All trucks and equipment will be washed before exiting the construction site.
- Exposed surfaces and unpaved roads will be watered three times daily.
- Vehicle travel speed on unpaved roads will be reduced to 15 miles per hour.
- Any dust-generating activities will be suspended when wind speed exceeds 25 mph.
- All disturbed areas, including storage piles that are not being actively used for construction purposes will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant, or covered with a tarp or other suitable cover or vegetative ground cover.
- All onsite unpaved roads and offsite unpaved access roads will be effectively stabilized for dust emissions using water or a chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities will be effectively controlled for fugitive dust emissions by an application of water or by presoaking. With the demolition of buildings up to six stories in height, all exterior surfaces of the buildings will be wetted during demolition.
- All materials transported offsite will be covered or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container will be maintained.
- All operations will limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.

- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, piles will be effectively stabilized for fugitive dust emissions using sufficient water or a chemical stabilizer/suppressant.
- Within urban areas, trackout will be immediately removed when it extends 50 or more feet from the site and at the end of each workday.
- Any site with 150 or more vehicle trips per day will prevent carryout and trackout.
- Use of low-VOC paint that contains less than 10% of VOC contents. (VOC, 10%). A Super-compliant or Clean Air paint that has a lower VOC content than those required by South Coast AQMD Rule 1113, will also be used when available.

A3.0 Noise and Vibration Design Features

The Authority and the FRA have considered avoidance and minimization measures consistent with the Statewide and Bay Area to Central Valley Program EIR/EIS commitments. FTA and FRA have guidelines for minimizing noise and vibration impacts at sensitive receptors that will be followed during construction.

A4.0 EMI/EMF Design Features

The HST project would adhere to international guidelines and comply with applicable federal and state laws and regulations. Similarly, project design will follow the EMCPP to avoid EMI and to ensure HST operational safety. Some features of the EMCPP include:

- During the planning stage through system design, the Authority will perform EMC/EMI safety analyses, which will include identification of existing nearby radio systems, design of systems to prevent EMI with identified neighboring uses, and incorporation of these design requirements into bid specifications used to procure radio systems.
- Pipelines and other linear metallic objects that are not sufficiently grounded through the direct contact with earth would be separately grounded in coordination with the affected owner or utility to avoid possible shock hazards. For cases where metallic fences are purposely electrified to inhibit livestock or wildlife from traversing the barrier, specific insulation design measures would be implemented.
- HST standard corrosion protection measures would be implemented to eliminate risk of substantial corrosion of nearby metal objects.
- The Authority will work with the engineering departments of BNSF Railway, UPRR, and SJVR where these railways parallel the HST to apply the standard design practices to prevent interference with the electronic equipment operated by these railroads. Design provisions to prevent interference would be put in place and determined to be adequately effective prior to the activation of potentially interfering systems of the HST.

Applicable design standards for EMI/EMF that would be used for the project are provided in Appendix 2-D.

A5.0 Public Utilities/Energy Design Features

Statewide Program EIR/EIS mitigation strategies have been refined and adapted for this project-level EIR/EIS. The project design incorporates precautions to avoid existing utilities and design elements that minimize electricity consumption (e.g., using regenerative braking, and

energy-saving equipment and facilities). Refer to Section 3.8, Hydrology and Water Resources, for project design features for stormwater management and treatment.

Where necessary, project design and phasing of construction activities would be coordinated with service providers to minimize or avoid interruptions, including for upgrades of existing power lines to connect the HST System to existing PG&E substations. Where relocating an irrigation facility is necessary, the Authority shall ensure that where feasible the new facility is operational prior to disconnecting the original facility. Prior to construction in areas where utility service interruptions are unavoidable, the contractor would notify the public through a combination of communication media (e.g., by phone, email, mail, newspaper notices, or other means) within that jurisdiction and the affected service providers of the planned outage. The notification would specify the estimated duration of the planned outage and would be published no fewer than 7 days prior to the outage. Construction would be coordinated to avoid interruptions of utility service to hospitals and other critical users.

A6.0 Biological Resources Design Features

In addition to the mitigation measures described below in Section 3.7.7, multiple project design features have been developed for the Fresno to Bakersfield Section to avoid and minimize potential impacts and effects on biological resources.

At multiple locations, the route of the alternative alignments was altered to avoid impacts and effects to biological resources. From the results of preliminary surveys, which identified areas of high-quality biological and wetland resources in the vicinity of the Colonel Allensworth State Historic Park and Allensworth Ecological Reserve, the Allensworth Bypass was sited to avoid significant impacts to these resources. Engineering changes were made to the alternative alignments in the vicinity of the Corcoran Bypass to avoid impacts to the Tulare Lakebed Mitigation Site and the seasonal wetlands associated with Cross Creek. Additional engineering changes were made along the Wasco-Shafter Bypass to avoid impacts to local development plans.

As discussed in Chapter 2, Alternatives, wildlife crossing opportunities will be available through a variety of engineered structures, including dedicated wildlife crossing structures, elevated structures, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60- to 120-inch] culverts and paired 30-inch culverts). For a more detailed discussion of the crossing structures, including figures depicting the frequency and locations of these structures, refer to Figures 3-3a through 3-3d and Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Additionally, during project design and construction, the Authority and FRA would implement measures to reduce impacts on air quality and hydrology based on applicable design standards. Implementation of these measures would also reduce impacts to biological resources. The design standards applicable to the project are listed in Appendix 2-D and the measures to be applied are summarized in Section 3.3, Air Quality and Global Climate Change and Section 3.8, Hydrology and Water Resources.

A7.0 Hydrology and Water Quality Design Features

The Authority and FRA have considered avoidance and minimization measures consistent with commitments in the Program EIR/EIS documents. During project design and construction, the Authority and FRA would ensure that the measures outlined below are implemented to reduce impacts on water resources, as discussed in Section 3.8.5, Environmental Consequences. Applicable design standards for hydrology and water resources that would be used for the project

are provided in Appendix 2-D. These measures and standards are discussed in greater detail in supporting documents prepared for the preliminary design, including the following:

- HST Technical Memorandum 2.6.5. Hydraulics and Hydrology Design Guidelines (Authority 2010).
- Fresno to Bakersfield Section Hydrology, Hydraulics, and Drainage Report (Authority 2012c).
- Fresno to Bakersfield Section Floodplains Impact Report (Authority 2012b).
- Fresno to Bakersfield Section Stormwater Quality Management Report (Authority 2012e).

These measures are considered to be part of the project and are described in the following text. Additionally, the project would require an Individual Section 404 Permit from USACE. This permit would have conditions to further minimize water quality impacts.

Project Design Features for Stormwater Management and Treatment. During the detailed design phase, each receiving stormwater system's capacity will be evaluated to accommodate project runoff for the design storm event. As necessary, onsite stormwater management measures, such as detention or selected upgrades to the receiving system, will be designed to provide adequate capacity and to comply with the design standards in Appendix 2-D and the latest version of *Technical Memorandum 2.6.5 Hydraulics and Hydrology Guidelines* (Authority 2011). Onsite stormwater management facilities will be designed and constructed to capture runoff and provide treatment prior to discharge of pollutant-generating surfaces, including station parking areas, access roads, new road over- and underpasses, reconstructed interchanges, and new or relocated roads and highways. Low-impact development (LID) techniques will be used to detain runoff onsite and to reduce offsite runoff. Constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters) such as vegetated swales and grass filter strips will be used, where appropriate. Portions of the HMF site will be used for onsite infiltration of runoff, if feasible, or for stormwater detention if not feasible. Stormwater infiltration or detention facilities are to be built in compliance with the design standards indicated in Appendix 2-D. Vegetated setbacks from streams will be used.

Project Design Features for Flood Protection. The project will be designed to both remain operational during flood events and to minimize increases in 100-year flood elevations. Design standards will include the following:

- Establish track elevation to prevent saturation and infiltration of stormwater into the sub-ballast.
- Minimize development within the floodplain, to such an extent that water surface elevation in the floodplain would not increase by more than 1 foot, or as required by state or local agencies, during the 100-year flood flow. Avoid placement of facilities in the floodplain (e.g., at the Shafter East and Shafter West HMF sites) or raise the ground with fill above the base-flood elevation.

The floodplain crossings will be designed to maintain a 100-year floodwater surface elevation of no greater than 1 foot above current levels, or as required by state or local agencies, and will not increase existing 100-year floodwater surface elevations in FEMA-designated floodways.

The following design standards would minimize the effects of pier placement on floodplains and floodways:

- Design site crossings to be as nearly perpendicular to the channel as feasible to minimize bridge length.
- Orient piers to be parallel to the expected high-water flow direction to minimize flow disturbance.
- Elevate bridge crossings at least 3 feet above the high-water surface elevation to provide adequate clearance for floating debris, or as required by local agencies. (The Central Valley Flood Protection Board [CVFPB] requires that the bottom members [soffit] of a proposed bridge be at least 3 feet above the design floodplain. The required clearance may be reduced to 2 feet on minor streams at sites where significant amounts of stream debris are unlikely.)
- Conduct engineering analyses of channel scour depths at each crossing to evaluate the depth for burying the bridge piers and abutments. Implement scour-control measures to reduce erosion potential.
- Use quarry stone, cobblestone, or their equivalent for erosion control along rivers and streams, complemented with native riparian plantings or other natural stabilization alternatives that would restore and maintain a natural riparian corridor.
- Place bedding materials under the stone protection at locations where the underlying soils require stabilization as a result of stream-flow velocity.

Construction Stormwater Pollution Prevention Plan. The SWRCB Construction General Permit (Order No. 2009-0009 DWQ, NPDES No. CAS000002) establishes three project risk levels that are based on site erosion and receiving-water risk factors. Risk Levels 1, 2, and 3 correspond to low-, medium-, and high-risk levels for a project. A preliminary analysis indicates that most of the project would fall under Risk Level 1, the lowest risk level. However, sections of the project may be more appropriately categorized as Risk Level 2 due to the combination of local rainfall, soil erodibility, and the lengths of the constructed slopes. For example, the portion of the project draining to Kings River would fall under Risk Level 2. Risk Level 2 measures also would be carried out anywhere in the project vicinity where construction activities are conducted within or immediately adjacent to sensitive environmental areas such as streams, wetlands, and vernal pools.

The Construction General Permit requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which would provide BMPs to minimize potential short-term increases in sediment transport caused by construction, including erosion control requirements, stormwater management, and channel dewatering for affected stream crossings. These BMPs will include measures to provide permeable surfaces where feasible and to retain or detain and treat stormwater onsite. Other BMPs include strategies to manage the overall amount and quality of stormwater runoff. The Construction SWPPP will include measures to address, but are not limited to, the following:

- Hydromodification management to ensure maintenance of pre-project hydrology by emphasizing onsite retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation, supplemented by detention, where required. Additional flow control measures will be implemented where local regulations or drainage requirements dictate.
- Implementing practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater.

- Limiting fueling and other activities using hazardous materials to areas distant from surface water, providing drip pans under equipment, and daily checks for vehicle condition.
- Implementing practices to reduce erosion of exposed soil, including soil stabilization, watering for dust control, perimeter silt fences, and sediment basins.
- Implementing practices to maintain current water quality including silt fences, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, and Baker tanks and sediment traps to settle sediment.
- Implementing practices to capture and provide proper offsite disposal of concrete washwater, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatment with dry ice or other acceptable means to reduce the alkaline character of the runoff (high pH) that typically results from new concrete.
- Developing and implementing a spill prevention and emergency response plan to handle potential fuel or other spills.
- Using diversion ditches to intercept offsite surface runoff.
- Where feasible, avoiding areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.
- Where feasible, limiting construction to dry periods when flows in water bodies are low or absent.

Implementation of a SWPPP is the responsibility of the construction contractor's Qualified SWPPP Practitioner (QSP) or designee. As part of that responsibility, the effectiveness of construction BMPs must be monitored before and after storm events. Records of these inspections and monitoring results are submitted to the SWRCB/ Regional Water Quality Control Board (RWQCB) as part of the annual report required by the Statewide Construction General Permit. The reports are available to the public online. The SWRCB and RWQCB have the opportunity to review these documents.

Regional Dewatering Permit. The Central Valley RWQCB, Order No. R5-2008-0081, *Waste Discharge Requirements General Order for Dewatering and Other Low Threat Discharges to Surface Waters*, is a permit that covers construction dewatering discharges and some other listed discharges that do not contain significant quantities of pollutants, and that either (1) are 4 months, or less, in duration, or (2) have an average dry-weather discharge that does not exceed 0.25 million gallons per day.

Flood Protection. The CVFPB regulates specific river, creek, and slough crossings for flood protection. These crossings must meet the provisions of Title 23 of the CCR. Title 23 requires that new crossings maintain hydraulic capacity through such measures as in-line piers, adequate streambank height (freeboard), and measures to protect against streambank and channel erosion. Section 208.10 requires that improvements, including crossings, be constructed in a manner that does not reduce the channel's capacity or functionality, or that of any federal flood control project. The CVFPB reviews applications for encroachment permits for approval of a new channel crossing or other channel modification. For a proposed crossing or placement of a structure near a federal flood control project, the CVFPB coordinates review of the encroachment permit application with USACE pursuant to assurance agreements with USACE and the USACE Operation and Maintenance Manuals under Title 33 CFR, Section 208.10 and Title 33 U.S.C., Section 408. Under Section 408 of the Rivers and Harbors Act, the USACE must approve any proposed modification that involves a federal flood control project. A Section 408 permit would

be required if construction modifies a federal levee. A Section 208.10 permit would be required where the project encroaches on a federal facility but does not modify it.

Industrial Stormwater Pollution Prevention Plan. The stormwater general permit (Order No. 97-03-DWQ, NPDES No. CAS000001) requires preparation of a SWPPP and a monitoring plan for industrial facilities that discharge stormwater from the site, including vehicle maintenance facilities associated with transportation operations. The permit includes performance standards for pollution control. The HMF would meet the stormwater treatment requirements of the Industrial General Permit.

A8.0 Geology, Soils, and Seismicity Design Features

No project-level mitigation measures will be required. Project design will incorporate engineering measures and BMPs based upon federal and state regulations and on the Statewide Program EIR/EIS (Authority and FRA 2005). Site-specific geotechnical investigations will be carried out as design work progresses so that the project can incorporate site-specific engineering solutions that adhere to regional and national technical standards and codes into the design to reduce risks associated with the geology, soils, and seismicity. Applicable design standards for Geology, Soils, and Seismicity that would be used for the project are provided in Appendix 2-D. The technical standards and codes include the following:

- 2010 American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications and the 2009 AASHTO Guide Specifications for Load and Resistance Factor Design Seismic Bridge Design:** These documents provide guidance for characterization of soils, as well as methods to be used in the design of bridge foundations and structures, retaining walls, and buried structures. These design specifications will provide minimum specifications for evaluating the seismic response of the soil and structures.
- Federal Highway Administration (FHWA) Circulars and Reference Manuals:** These documents provide detailed guidance on the characterization of geotechnical conditions at sites, methods for performing foundation design, and recommendations on foundation construction. These guidance documents include methods for designing retaining walls used for retained cuts and retained fills, foundations for elevated structures, and at-grade segments. Some of the documents include guidance on methods of mitigating geologic hazards that are encountered during design.
- American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual:** These guidelines deal with rail systems. Although they cover many of the same general topics as AASHTO, they are more focused on best practices for rail systems. The manual includes principles, data, specifications, plans, and economics pertaining to the engineering, design, and construction of railways.
- California Building Code:** The code is based on 2009 International Building Code (IBC). This code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance.
- IBC and American Society of Civil Engineers (ASCE)-7:** These codes and standards provide minimum design loads for buildings and other structures. They would be used for the design of the maintenance facilities and stations. Sections in IBC and ASCE-7 provide minimum requirements for geotechnical investigations, levels of earthquake ground shaking, minimum standards for structural design, and inspection and testing requirements.

- **Caltrans Design Standards:** Caltrans has specific minimum design and construction standards for all aspects of transportation system design, ranging from geotechnical explorations to construction practices. These amendments provide specific guidance for the design of deep foundations that are used to support elevated structures, for design of mechanically stabilized earth (MSE) walls used for retained fills, and for design of various types of cantilever (e.g., soldier pile, secant pile, and tangent pile) and tie-back walls used for retained cuts.
- **Caltrans Construction Manuals:** Caltrans has a number of manuals including Field Guide to Construction Dewatering, Caltrans Construction Site Best Management Practices (BMPs) Manual and Construction Site Best Management Practice (BMP) Field Manual and Troubleshooting Guide that provide guidance and Best Management Practices for dewatering options and management, erosion control and soil stabilization, non-storm water management, and waste management at construction sites.
- **American Society for Testing and Materials (ASTM):** ASTM has developed standards and guidelines for all types of material testing- from soil compaction testing to concrete-strength testing. The ASTM standards also include minimum performance requirements for materials. Most of the guidelines and standards cited above use ASTM or a corresponding series of standards from AASHTO to assure that quality is achieved in the constructed project.

To manage geologic, soils, and seismic hazards, site-specific geotechnical investigations will be conducted and, based on that information, the project will implement the following specific measures to reduce and avoid impacts during construction and operation. These practices include the following:

- **Limit Groundwater Withdrawal:** Control the amount of groundwater withdrawal from the project, re-inject groundwater at specific locations if necessary, or use alternate foundation designs to offset the potential for settlement. This control is important for locations with retained cuts in areas where high groundwater exists, and where existing buildings are located near the depressed track section.
- **Monitor Slopes:** Incorporate slope monitoring into final design where a potential for long-term instability exists from gravity or seismic loading. This practice is important near at-grade sections where slope failure could result in loss of track support or where slope failure could result in additional earth loading to foundations supporting elevated structures.
- **Conduct Geotechnical Inspections:** Prior to and throughout construction, conduct geotechnical inspections to verify that no new, unanticipated conditions are encountered, and to determine the locations of unstable soils in need of improvement.
- **Improve Unstable Soils:** Employ various methods to mitigate for the risk of ground failure from unstable soils. If the soft or loose soils are shallow, they can be excavated and replaced with competent soils. To limit the excavation depth, replacement materials can also be strengthened using geosynthetics. Where unsuitable soils are deeper, ground improvement methods, such as stone columns, cement deep-soil-mixing, or jet-grouting, can be used. Alternatively, if sufficient construction time is available, preloading—in combination with prefabricated vertical drains (wicks) and staged construction—can be used to gradually improve the strength of the soil without causing bearing-capacity failures. Both over-excavation and ground improvement methods have been successfully used to improve similar soft or loose soils. Lime treatment of heavy rail subgrades over soft soils has also been used successfully in the San Joaquin Valley. The application of these methods is most likely at stream and river crossings, where soft soils could occur; however, localized deposits could

occur at other locations along the alignment. The ground improvement or over-excavation methods may also be necessary at the start of approach fills for elevated track sections or retained-earth segments of the alignment if the earth loads exceed the bearing capacity of the soil. Alternatively, at these locations, earth fills might be replaced by lightweight fill, such as lightweight concrete, extruded polystyrene (geofoam), or short columns, and cast-in-drilled hole (CIDH) piles might be used to support the transition from the elevated track to the at-grade alignment.

- Improve Settlement-Prone Soils:** Settlement-prone soils are improved prior to facility construction. Ground improvement is used to transfer new earth loads to deeper, more competent soils. Another alternative is to use preloads and surcharges with wick drains to accelerate settlement in areas that are predicted to undergo excessive settlement. By using the preload and surcharge with wick drains, settlement would be forced to occur. The application of these methods is most likely at stream and river crossings, where soft soils are more likely to occur. Where groundwater is potentially within 50 feet of the ground surface, any below-ground excavations use well points in combination with sheet pile walls to limit the amount of settlement of adjacent properties from temporary water drawdown. Alternately, water can be re-injected to make up for localized water withdrawal.
- Prevent Water and Wind Erosion:** Many mitigation methods exist for controlling water and wind erosion of soils. These include use of straw bales and mulches, revegetation, and covering areas with geotextiles. Where the rate of water runoff could be high, riprap and riprap check dams could be used to slow down the rate of water runoffs. Other BMPs for water are discussed in Section 3.8, Hydrology and Water Resources. Implementation of these methods is important where large sections of earth are exposed during construction, such as for retained-cut segments.
- Modify or Remove and Replace Soils with Shrink-Swell Potential and Corrosion Characteristics:** One option is to excavate and replace soils that represent the highest risk. In locations where shrink-swell potential is marginally unacceptable, soil additives would be mixed with existing soil to reduce the shrink-swell potential. The decision whether to remove or treat the soil is made on the basis of specific shrink-swell potential or corrosivity characteristics of the soil, the additional costs for treatment versus excavation and replacement, as well as the long-term performance characteristics of the treated soil. This practice is important for at-grade segments of the alignment because these are most likely to be affected by shrink-swell potential or corrosive soils.
- Evaluate and Design for Large Seismic Ground Shaking:** Prior to final design, additional seismic studies will be conducted to establish the most up-to-date estimation of levels of ground motion. Updated Caltrans seismic design criteria will be used in the design of any structures supported in or on the ground. These design procedures and features reduce the potential that moments, shear forces, and displacements that result from inertial response of the structure will lead to collapse of the structure. In critical locations, pendulum base isolators can reduce the levels of inertial forces. New composite materials can enhance seismic performance.
- Secondary Seismic Hazards:** As discussed above, various ground improvement methods can be implemented to mitigate the potential for liquefaction, liquefaction-induced lateral spreading or flow of slopes, or post-earthquake settlement. Ground improvement around CIDH piles improves the lateral capacity of the CIDH during seismic loading. Cement deep-soil-mixing stone columns, EQ drains or jet grouting develop resistance to lateral flow or spreading of liquefied soils.

- **Suspend Operations During or After an Earthquake:** Install motion-sensing instruments to provide ground-motion data; install a control system to shut down HST operations temporarily during or after a potentially damaging earthquake to reduce risks. Monitors will be installed at select locations where high ground motions could damage the HST track system. Candidate locations would include, but are not limited to, elevated guideways and retained-earth, retained-cut, and at-grade segments.

A9.0 Hazardous Materials and Wastes Design Features

The Authority and FRA have considered avoidance and minimization measures consistent with the commitments in the Statewide Program EIR/EIS documents. Applicable design standards for hazardous materials and waste that would be used for the project are provided in Appendix 2-D.

- Materials and wastes would be handled, transported, and disposed of in accordance with applicable state and federal regulations, such as Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Hazardous Materials Release Response Plans and Inventory Law, and the Hazardous Waste Control Act (see Section 3.3, Air Quality, for regulations applying to hazardous air pollutants).
- During the property acquisition process, analysis of properties acquired for construction of the HST will be conducted, as needed, including title searches and determination of which properties require further assessment for hazardous material contamination. Prior to acquisition of properties, the Authority will conduct Phase 1 environmental site assessments in accordance with standard ASTM methodologies to characterize each site. The determination of what parcels require soil testing and where testing should occur would be informed by the Phase 1 environmental site assessment and made in conjunction with state and local agency officials. Testing and appropriate remediation would be conducted prior to acquisition. Remediation activities may include removal of contamination, in-situ treatment, or soil capping.
- All work within 1,000 feet of a landfill would require methane protection measures, including gas detection systems and personnel training, pursuant to Title 27, the hazardous materials contingency plan, and BMPs.
- Nominal design variances, such as the addition of a plastic barrier beneath the ballast material to limit the potential release of volatile subsurface contaminants, may be implemented in conjunction with site investigation and remediation.
- The Authority is aware that undocumented contamination could be encountered during construction activities and is committed to work closely with local agencies to resolve any such encounters. A construction management plan will be developed that will include provisions for the disturbance of undocumented contamination.
- Demolition plans will be prepared for the safe dismantling and removal of building components and debris. The demolition plans will include a plan for lead and asbestos abatement.
- An SPCC plan or, for smaller quantities, a spill prevention and response plan, will be implemented that prescribes BMPs to follow to clean up any hazardous material release. During operation of the HST, hazardous materials monitoring plans, such as a hazardous materials business plan and an SPCC plan, will be implemented.

- Storage of hazardous materials during construction and operation will meet requirements for transport, labeling, containment, cover, and other BMPs to comply with the State Water Resources Control Board Construction General Permit conditions.
- To the extent feasible, the Authority is committed to identifying, avoiding, and minimizing hazardous substances in the material selection process for construction, operation, and maintenance of the HST system. Moreover, using an Environmental Management System, the Authority will evaluate the full inventory of hazardous materials employed on an annual basis and will replace hazardous substances with nonhazardous materials to the extent possible. These standards and material specifications would aid in promoting safety for passengers and employees.

A10.0 Safety And Security Design Features

Project design would incorporate engineering measures and best management practices based on federal and state regulations and on the Statewide Program EIR/EIS (Authority and FRA 2005). Applicable design standards for safety and security that would be used for the project are provided in Appendix 2-D. The standard engineering design guidelines and regulatory requirements include the following:

- Final design includes development of a detailed construction transportation plan that would include coordination with local jurisdictions on emergency vehicle access. The plan would establish procedures for temporary road closures including: access to residences and businesses during construction, lane closure, signage and flag persons, temporary detour provisions, alternative bus and delivery routes, emergency vehicle access, and alternative access locations.
- Engineering design and construction phases include preliminary hazard analysis (PHA), collision hazard analysis (CHA), and threat and vulnerability assessment (TVA) methods.
- PHAs follow the U.S. Department of Defense's System Safety Program Plan Requirements (MIL-STD-882) to identify and determine the facility hazards and vulnerabilities so that they can be addressed—and either eliminated or minimized by—the design.
- CHAs follow the Federal Railroad Administration's Collision Hazard Analysis Guide: Commuter and Intercity Passenger Service (FRA 2007) which provides a step-by-step procedure on how to perform a hazard analysis and how to develop effective mitigation strategies that will improve passenger rail safety.
- TVAs establish provisions for the deterrence and detection of, as well as the response to, criminal and terrorist acts for rail facilities and system operations. Provisions include right-of-way fencing, intrusion detection, security lighting, security procedures and training, and closed-circuit television. Intrusion-detection technology could also alert to the presence of inert objects, such as toppled tall structures or derailed freight trains, and stop HST operations to avoid collisions
- Construction Safety and Health Plans (CSHPs) establish the minimum safety and health guidelines for contractors of, and visitors to, construction projects. CSHPs require contractors to develop and implement site-specific measures that address regulatory requirements to protect human health and property at construction sites. CSHPs shall include the following¹:

¹ These Findings were completed in draft form in late April and adopted by the CHSRA Board on May 7, 2014. The only change to the draft Findings made by the CHSRA Board was inclusion of these four additional CSHPs items.

1. Train workers and supervisors to recognize symptoms of illness, and ways to minimize exposure, such as washing hands at the end of shifts.
 2. Provide washing facilities nearby for use at the end of shifts.
 3. Provide vehicles with enclosed, air-conditioned cabs and ensure workers keep windows closed. Equip heavy equipment cabs with high efficiency particulate air (EPA) filters.
 4. Make National Institute for Occupational Safety and Health (NIOSH) -approved respiratory protection with particulate filters as recommended by the California Department of Public Health available to workers who request them.
- Fire/Life Safety Programs (FLSPs) implement the requirements set forth in the Federal Rail Safety Act. FLSPs address the safety of passengers and employees during emergency response. The FLSP also would address the needs of disabled persons. A FLSP is coordinated with local emergency response organizations to provide them with an understanding of the rail system, facilities, and operations, and to obtain their input for modifications to emergency response operations and facilities, such as evacuation routes.
 - System Security Plans address design features intended to maintain security at the stations within the track right-of-way, at stations, and onboard trains. The design standards and guidelines require emergency walkways on both sides of the tracks for both elevated and at-grade sections. Adequate space would be present along at-grade sections of the alignment to allow emergency response access. Ground access would be available from elevated tracks where access to ground equipment is required. This ground access could be used in the event of an emergency. Additional ground access would be considered, consistent with fire and rescue procedures and where practical operational standards include a system-specific police force.
 - Standard operating procedures and emergency operating procedures include industry best practices, such as the FRA-mandated Roadway Worker Protection Program. They address the day-to-day operation and emergency situations to maintain the safety of employees, passengers, and the public.
 - System Safety Program Plans (SSPPs) incorporate FRA requirements and are implemented upon FRA approval. These plans are based on the principles outlined in *The Manual for Development of System Safety Program Plans for Commuter Railroads* (American Public Transportation Association 2006) and address project design, construction, testing, and operation.
 - Rail systems must comply with FRA requirements for tracks, equipment, railroad operating rules, and practices, including the Passenger Equipment Safety Standards (49 CFR Part 238), Highway-Rail Grade Crossing Guideline for the High-Speed Passenger Rail (FRA 2009), and track safety standards (49 CFR Part 213). Requirements include warning systems and barrier systems to enhance track safety.
 - Worker safety in the workplace is generally governed by the Occupational Health and Safety Act of 1970, which established the Occupational Safety and Health Administration (OSHA). OSHA establishes standards and oversees compliance with workplace safety and reporting of injuries and illnesses of employed workers. In California, OSHA enforcement of workplace requirements is performed by Cal OSHA. Under Cal OSHA regulations, as of July 1, 1991, every employer must establish, implement, and maintain an injury and illness prevention program.

- HST urban design guidelines (Authority 2011b) require implementing the principles of Crime Prevention through Environmental Design. This is a design method that focuses on reducing opportunities for crime through the design and management of the physical environment. Four basic principles of Crime Prevention through Environmental Design should be considered during station and site planning: territoriality (designing physical elements that express ownership of the station or site); natural surveillance (arranging physical features to maximize visibility); improve sightlines (provide clear views of surrounding areas); and access control (physical guidance of people coming and going from a space).

A11.0 Socioeconomics, Communities, and Environmental Justice Design Features

The Authority will require that the design-build contractor will develop and implement a construction management plan to address communications, community impacts, visual protection, air quality, safety controls, noise controls, and traffic controls to minimize impacts on low-income households and minority populations. The plan will assure property access is maintained for local businesses, residences, and emergency services. This plan will include maintaining customer and vendor access to local businesses throughout construction by using signs to instruct customers about access to businesses during construction. In addition, the plan will include efforts to consult with local transit providers to minimize impacts on local and regional bus routes in affected communities. Construction Management Plans are standard for large infrastructure projects such as this one, and are considered effective in minimizing community impacts.

The Authority has considered avoidance and minimization measures that are consistent with the Statewide Program EIR/EIS (Authority and FRA 2005) and Bay Area to Central Valley Program EIR/EIS commitments (Authority and FRA [2008] 2010). The Authority must comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended (Uniform Act).

The provisions of the Uniform Act, a federally mandated program, would apply to all acquisitions of real property or displacements of persons resulting from this federally assisted project. It was created to provide for and ensure fair and equitable treatment of all affected persons. Additionally, the Fifth Amendment of the United States Constitution provides that private property may not be taken for a public use without payment of "just compensation."

The Uniform Act requires that the owning agency provide notification to all affected property owners of the agency's intent to acquire an interest in their property. This notification includes a written offer letter of just compensation. A right-of-way specialist is assigned to each property owner to assist him or her through the acquisition process. The Uniform Act also provides benefits to displaced individuals to assist them financially and with advisory services related to relocating their residence or business operation. Benefits are available to both owner occupants and tenants of either residential or business properties.

The Uniform Act requires provision of relocation benefits to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits to which eligible owners or tenants may be entitled are determined on an individual basis and explained in detail by an assigned right-of-way specialist.

Similarly, the project must adhere to California Relocation Assistance Act requirements. Owners of private property have federal and state constitutional guarantees that their property will not be acquired or damaged for public use unless owners first receive just compensation. Just compensation is measured by the "fair market value," where the property value is considered to be the highest price that would be negotiated on the date of valuation. The value must be

agreed upon by a seller who is willing, not obliged to sell, but under no particular or urgent necessity and by a buyer who is ready, willing, and able to buy but under no particular necessity. Both the owner and the buyer must deal with the other with the full knowledge of all the uses and purposes for which the property is reasonably adaptable and available (Code of Civil Procedure Section 1263.320a).

The Authority has developed more detailed information about how it plans to comply with the Uniform Act and the California Relocation Assistance Act. The Authority has developed three detailed relocation assistance documents modeled after Caltrans versions. The documents are listed below and included in Appendix 3.12-A:

- Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Residential).
- Your Rights and Benefits as a Displacee under the Uniform Relocation Assistance Program (Mobile Home).
- Your Rights and Benefits as a Displaced Business, Farm, or Nonprofit Organization under the Uniform Relocation Assistance Program.

Before any acquisitions occur, the Authority will develop a relocation mitigation plan, in consultation with affected cities and counties. In addition to establishing a program to minimize the economic disruption related to relocation, the relocation mitigation plan will be written in a style that also enables it to be used as a public-information document.

The plan will be designed to meet the following objectives:

- Provide affected property and business owners and tenants a high level of individualized assistance in situations when relocation is necessary.
- Coordinate relocation activities with other agencies causing displacements in the study area to ensure that all displaced persons receive fair and consistent relocation benefits
- Make a best effort to minimize the permanent closure of displaced businesses and non-profit agencies as a result of relocations.
- Within the limits established by law and regulation, minimize the economic disruption caused to tenants and residents by relocation.
- In individual situations, where warranted, consider the cost of obtaining the entitlement permits necessary to relocate to a suitable location and take those costs into account when establishing the fair market value of the property.
- Provide those business owners who require complex permitting (such as dairies) with regulatory compliance assistance.

The relocation mitigation plan will include the following components:

- A description of the appraisal, acquisition, and relocation process that describes the activities of the appraisal and relocation specialists, for the benefit of the reader.
- A means of assigning appraisal and relocation staff to affected property owners, tenants, or other residents on an individual basis.

- Individualized assistance to affected property owners, tenants, or other residents in applying for funding, including research to summarize loans, grants, and federal aid available, and research of demographically similar areas for relocation.
- Creation of an ombudsman's position to act as a single point of contact for property owners, residents, and tenants with questions about the relocation process. The ombudsman would also act to address concerns about the relocation process as it applies to the individual situations of property owners, tenants, and other residents.

Relocation Mitigation Plans are commonly used for large infrastructure projects that displace a large number of residences and businesses, such as this project, and are considered successful in minimizing the impact to individual property owners.

A12.0 Station Planning, Land Use, and Development Design Features

Although not strictly part of the project design, the Authority has established a certain "zone of responsibility" around the proposed stations. To that end, the Authority prepared and distributed *Urban Design Guidelines* (Authority [2010] 2011b) available on the Authority's website to provide assistance in urban planning for the stations to help achieve great placemaking. The guidelines are based on international examples where cities and transit agencies have incorporated sound urban design principles as integrated elements of large-scale transportation systems. The application of sound urban design principles to the HST System will help to maximize the performance of the transportation investment, enhance the livability of the communities it serves, create long-term value, and sensitively integrate the project into the communities along the HST System corridor. The Authority and FRA have also provided planning grants for cities that could have an HST station to assist them in land use planning in the areas surrounding the stations.

The Authority could provide less parking at the Kings/Tulare Regional Station site than described in Chapter 2 by working with local communities such as Hanford, Visalia, and Tulare to provide parking at satellite lots in those communities with frequent transit service to the stations.

Project design features would reduce some of the temporary land use impacts from project construction. These features are described in Section 3.12.6, Socioeconomics, Communities, and Environmental Justice, and in Section 3.3.8, Air Quality and Global Climate Change. They include implementation of a construction management plan to minimize temporary impacts on adjacent land uses and implementation of dust control measures during project construction.

A13.0 Agricultural Land Design Features

The following design features are considered a part of the HST project.

Restoration of Land Used for Temporary Staging Areas. All staging areas on Important Farmlands will be returned to as close to their pre-construction staging condition as possible with the goal of ensuring these parcels remain available for long-term agricultural use.

Farmland Consolidation Program. The Authority will establish and administer a farmland consolidation program to sell remnant parcels to neighboring landowners for consolidation with adjacent farmland properties. In addition, on request, the program will assist the owners of remnant parcels in selling those remnants to adjacent landowners. The goal of the program is to provide The program will focus on severed remainder parcels, including those that were under Williamson Act or Farmland Security Act contract at the time of right-of-way acquisition and have become too small to remain in the local Williamson Act or Farmland Security Act program. The program will assist landowners in obtaining lot line adjustments where appropriate to incorporate

remnant parcels into a larger parcel that is consistent with size requirements under the local government general plan. The program will operate for no less than 5 years after construction of the Fresno to Bakersfield Section is completed.

The Authority and FRA expect that productive farmland would be farmed in some manner, and not left idle in perpetuity. However, the Authority and FRA recognize that constructing the Fresno to Bakersfield HST project will have a disruptive effect on farm ownership that would temporarily idle some remainder parcels. The intent of the Farmland Consolidation Program is to take responsibility for the disruptive effects and proactively work to restore remainder parcels to productive agricultural use (and not rely on market forces to accomplish the same result). This process would be a series of real estate transactions, and the Authority would be using the same real property transaction processes used by Caltrans; this process features the use of Authority right-of-way agents who generally follow Caltrans procedures. The State of California has a long history of managing real estate transactions through Caltrans and other state entities (e.g., the Department of General Services), which helps promote the success of the Authority's farmland consolidation program.

Permit Assistance. The Authority will assign a representative to act as a single point of contact to assist each confined animal facility owner during the process of obtaining new or amended permits or other regulatory compliance necessary to the continued operation or relocation of the facility. The Authority will consider and may provide compensation when acquisition of a confined animal site would either require relocation of the facility or amendment of its existing regulatory permits.

Research. During the HST testing phase, the Authority will fund a program to undertake original research on the wind and noise effects of HST operations on agricultural activities. The Authority will engage qualified researchers within the University of California or California State University system to undertake this research. The researcher will be selected by the Authority through a request for proposal process. The research will include monitoring of noise and wind effects at representative points along the test track. The research period will include the testing phase and extend 2 years after commencement of revenue service. The Authority will publicly distribute a report of the findings of the research program.

The research will include, but is not limited to, the following subjects:

- Generated wind speed, duration, and area of influence from HST trainsets at typical operational speeds.
- Effects of HST-generated wind on the effectiveness of honey bee pollination.
- Dust production as a result of typical HST operations, including entrainment and dispersal patterns of dust in the HST slipstream.
- Generated noise levels and duration from HST trainsets at typical operational speeds.
- Noise contours depicting modeled noise levels at distance from the tracks.
- Practical methods for reducing effects on agriculture.

A14.0 Parks, Recreation, and Open Space Design Features

The Authority and FRA have considered avoidance and minimization measures consistent with the 2005 Statewide Program EIR/EIS commitments. During project design and construction, the Authority and FRA would implement measures to reduce impacts on parks and recreation resources. Implementation of these measures would also reduce impacts to parks and recreation resources. The design standards applicable to the project are summarized in Section 3.3.8 in Air Quality and Global Climate Change, Section 3.4.6 in Noise and Vibration and Section 3.16.6 in Aesthetics and Visual Resources.

A15.0 Aesthetics and Visual Quality Design Features

The Authority has adopted design standards and design guidelines that are established to create a minimum aesthetic quality to a long-lasting infrastructure. Many of these elements are articulated in Table 3.16-2 found in Section 3.16.5.3, High-Speed Train Alternatives of the Revised DEIR/Supplemental DEIS. In addition to the features described in Table 3.16-2, the Authority's *Urban Design Guidelines for the California High Speed Train Project* (Authority 2011b) briefly discusses the principles of context-sensitive solutions to guide the design of stations. This approach is equally applicable to elevated guideways and will be employed to mitigate visual impacts through context-sensitive design. *Aesthetic Guidelines for Non-Station Structures* (TM 200-06) (Authority 2011a) will also guide the design of the HST components. These standards and guidelines work to minimize and avoid aesthetic effects on the adjacent surroundings, where possible.

A16.0 Cultural and Paleontological Resources Design Features

The HST project has developed avoidance and minimization measures consistent with commitments in the Program EIR/EIS documents. Under Section 106 there are several regulatory requirements that must be followed during construction of any federally and state-funded project, such as halting work in the event of an unanticipated discovery. In addition, mitigation measures have been developed for treatment of adverse effects to compensate for impacts that cannot be avoided. Cultural resources mitigation measures and commitments could occur prior to, during, and following construction. Protective measures, such as conducting archaeological training, building stabilization or archaeological site capping, and recordation of resources would take place prior to construction; other protective measures such as vibration monitoring for built resources or monitoring for archaeological resources during ground-disturbing activities would occur during construction. Measures that could take place after construction may include interpretive programs, including displays, interpretive signage, etc.

The PA established the framework for the development and implementation of measures to avoid, minimize, and/or mitigate adverse effects on historic properties caused by the HST System, in compliance with Section 106 and NEPA. The PA also established that a MOA will be prepared for each section of the HST project to detail the HST project commitments to implement these treatments. The MOA for the Fresno to Bakersfield Section will be tiered from the PA and the Program EIR/EIS documents and will be developed in consultation with the SHPO and the ACHP. The MOA includes input from signatories, consulting and concurring parties, and other interested members of the public in the development of appropriate treatment measures. The MOA stipulates which treatment measures will be applied to which cultural resources and that the treatments will be described in two plans: the Archaeological Treatment Plan (ATP) and the Built Environment Treatment Plan (BETP). The ATP and BETP define the process by which these mitigation measures will be applied to each identified resource. The plans provide specific performance standards that ensure that each impact will be avoided, minimized, or mitigated to the extent possible at the time the treatment measures are applied to the specific resource. The ATP and BETP will be appended to the MOA as an enforceable tool. The MOA will be executed before the Record of Decision on the Fresno to Bakersfield Section is issued.

The ATP and BETP provide detailed descriptions of avoidance, minimization, and mitigation measures for the historic properties (Section 106) and historical resources (CEQA) adversely affected by the project. The ATP focused on the treatment of known buried historic properties and will provide guidance in the event of unanticipated discoveries. The BETP addresses historic architectural resources and describes the treatments to be applied to adversely affected resources in the built environment. The treatments include, but are not limited to, condition

assessments; vibration monitoring; or requirements for the moving, storing, shoring, stabilizing, monitoring, and rehabilitation or restoration of buildings. The ATP and BETP also outline the provisions of the other treatment measures to be carried out for this project, such as responses to inadvertent damage, interpretation mitigation, and monitoring protocols (see mitigation measures below). The MOA and treatment plans will be approved before the start of construction activities that could adversely affect historic properties or historical resources.

The mitigation measures provided will undergo additional refinement during the process of formulating the ATP and BETP. The exact nature of the treatments may differ from the mitigation measures in the EIR/EIS; however, because enforceable performance standards and criteria are part of the PA stipulations, the specifics regarding treatment—and which treatment will be applied to which resource—will be finalized during the ATP and BETP process. These specifics include specific commitments to follow the NRHP and the Secretary of Interior's standards when implementing the mitigation measures (see Stipulations III and VIII in the PA, Attachment 3.17 A). Also, the PA mandates that each treatment plan will set forth means to avoid, protect, or develop treatment measures to minimize the undertaking's effects when the Authority, in consultation with the appropriate agencies, the SHPO, and other MOA signatories, determines that adverse effects cannot be avoided. Consequently, the treatment plans will be at least as effective as the mitigation measures provided in the EIR/EIS and will be potentially more effective in reducing adverse or significant impacts to less-than-significant levels

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Attachment B
Noise and Vibration
Mitigation Guidelines

Proposed California High-Speed Train Project Noise and Vibration Mitigation Guidelines

B1.0 Purpose

The California High-Speed Rail Authority (Authority) and Federal Railroad Administration (FRA) conducted a noise and vibration impact analysis consistent with FRA methods for the proposed California High-Speed Train (HST) System. Adverse noise impacts and vibration impacts are anticipated in several areas along the alternatives. To reduce these potential impacts, mitigation measures such as constructing sound barriers or insulating affected buildings could be implemented. To the extent that mitigation measures are feasible and reasonable, they may be applied at the source, along the alignment, or at the receiving building. Criteria for implementing noise mitigation include balancing effectiveness, physical feasibility, cost, and density and proximity of sensitive receptors.

This memorandum presents the Authority's noise and vibration mitigation guidelines and incorporates by reference the guidelines, definitions, and technical manuals recognized by FRA as being consistent with FRA noise and vibration mitigation requirements. The guidelines are subject to revision.

B2.0 Regulatory Requirements

The National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) establish a mandate for federal and state agencies to incorporate environmental protection and enhancement measures into their proposed programs and projects. The FRA encourages noise abatement for HST projects where severe noise impacts are identified by using the methods in the FRA guidance manual (FRA 2005). The guidance manual includes noise criteria and guidelines to determine the need for mitigation. Noise criteria are stated in terms of outdoor exposure to project-related noise compared with existing noise levels. The manual defines three levels of impact: (1) No Impact, (2) Moderate Impact, and (3) Severe Impact. Project-related noise in the No Impact range is not likely annoying and is considered acceptable by FRA without mitigation. Moderate Impact means project-related noise would be noticeable and may result in some complaints from affected sites, but that impacts are not considered significant under CEQA and mitigation would not be required. Project-related noise in the Severe Impact range represents the most compelling need for mitigation and indicates a high level of annoyance from project noise at affected sites; these impacts are considered to be significant in the context of NEPA, Section 106 of the National Historic Preservation Act, and CEQA.

B3.0 Noise Mitigation Guidelines

In general, feasible and effective noise mitigation is required when severe or significant impacts are identified. Mitigation guidelines for the three impact categories identified by FRA are as follows:

- No Impact: No mitigation required.
- Moderate Impact: Mitigation not required but may be considered at the discretion of the Authority.

- Severe Impact: Consideration of feasible and effective mitigation is required if impacts cannot be avoided. The Authority will take steps to reduce noise substantially through mitigation measures that are reasonable, physically feasible, practical, and cost-effective.
- Potential noise impact is assessed and mitigation will be considered for undeveloped lands where sensitive receptors will be if there is substantial physical progress (e.g., laying the building foundation) toward the construction of the property by the time the notice of intent of the project has been issued.

B3.1 Mitigation of Severe Noise Impacts

The Authority has examined different mitigation measures to avoid, minimize, or mitigate severe noise impacts. If severe noise impacts cannot be avoided through project design changes, then the Authority will take steps to reduce severe noise substantially through mitigation measures that are reasonable, physically feasible, practical, and cost-effective.

The following criteria will be used for evaluating the reasonableness of any particular potential noise barrier as mitigation for severe noise impacts:

- Project noise-related increase over existing noise levels.
- Number of noise sensitive sites affected. Generally, at least 10 sites would have to be affected to justify a sound barrier.
- Sound barriers less than 800 feet long generally should not be considered.
- Barrier heights above 14 feet will not be recommended. Mitigation options for areas that require barriers over 14 feet tall will be studied on a case by case basis.
- Is the cost range for the noise barrier within \$45,000 (2010 dollars) per benefited residence?
- Does a substantial majority of the community approve of implementation?

Section 4(f) and Section 106 properties with severe or moderate noise impacts may require mitigation, may not be subject to these guidelines, and will be evaluated on a case-by-case basis.

B3.1.1 Substantial Noise Reduction

A sound barrier should be constructed only if it would result in a minimum outdoor noise reduction of 5 decibels (dB).

B3.1.2 Physically Feasible

Noise mitigation measures must be designed, constructed, installed, or implemented in compliance with structural requirements related to ground conditions, wind loading, seismic risk, safety considerations, accessibility, material maintainability and longevity, and applicable engineering design practices and technology.

Sound barriers are the most common noise mitigation measure. The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers should be designed to be as low as possible to achieve a substantial noise reduction. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit.

On aerial structures, the maximum sound barrier height would also be 14feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. Sound barriers on the aerial structure should still be designed to be as low as possible to achieve a substantial noise reduction.

B3.1.3 Visual Effects

Sound barriers could consist of solid, semitransparent, and transparent materials. Barriers could have visual effects, depending on their location and height. Sound barriers could be treated to reduce visual impacts.

B3.1.4 Cost-Effectiveness

The cost of any particular sound barrier as mitigation cannot exceed \$45,000 per benefitted building. This cost is determined by dividing the total cost of the mitigation measure by the number of affected noise-sensitive buildings that receive a substantial (i.e., 5-dB or greater) outdoor noise reduction. This calculation will generally limit the use of sound barrier mitigation in rural areas that have few and/or isolated residential buildings. If the density of residential dwellings is insufficient to make a sound barrier cost-effective, then other noise abatement measures, such as sound insulation, will be considered on a case-by-case basis. If sound insulation is identified as an alternative mitigation measure, the treatment must provide a substantial increase in noise reduction (i.e., 5 dB [A-weighted scale] or greater) between the outside to inside noise levels for the interior rooms exposed to HST-related noise. If sound insulation is not possible, feasible, or cost-effective, then the Authority will consider other measures, such as purchasing a noise easement.

B3.1.5 Reasonable

The above factors will have to be balanced to accomplish a package of noise mitigation measures that are effective but reasonable. Reasonableness implies that good judgment and common sense have been applied during the decision-making process. Reasonableness is determined on the basis of several factors regarding the individual circumstances and the specific needs of affected receivers.

B4.0 Vibration Mitigation Guidelines

Reactions to vibration impacts depend on the maximum levels for an average repeated train pass-by event. The frequency of events is a consideration in the FRA vibration impacts criteria. The FRA guidance manual provides vibration criteria. The FRA distinguishes between *frequent* and *infrequent* vibration events, defining frequent as more than 70 vibration or train pass-by events per day.

An HST may operate within close proximity to existing freight or passenger rail trains where ground vibration already may be present. In such cases, the impact of new HST service is assessed as follows:

- Infrequently Freight or Passenger Rail Services: Four or fewer freight and/or passenger trains per day; HST impact is assessed using the FRA vibration criteria.
- Moderate Freight or Passenger Rail Services: If up to 12 freight and/or passenger trains per day and FRA impact criteria are already exceeded, then HST is considered to cause no impact if its vibration is 5 dB lower than the existing freight and passenger rail operations. If not, HST impact is assessed using the FRA vibration criteria.

- Heavy Freight or Passenger Rail Services: If HSTs pass by at less than half as often as freight and passenger trains, then no impact exists unless the HST vibration exceeds the vibration levels of the freight and passenger operations.
- Where the HST track is closer to vibration sensitive receivers than an existing rail corridor, impact will be assessed if the existing train vibration levels are increased significantly. A significant increase is 3 vibration dB (VdB) or more.
- Potential vibration impact is assessed and mitigation will be considered for undeveloped lands where sensitive receptors will be if there is substantial physical progress (e.g., laying the building foundation) toward the construction of the property by the time the notice of intent of the project has been issued.

B4.1 Vibration Mitigation

Vibration mitigation will be considered whenever the criterion is exceeded as determined by detailed analysis. If found feasible and reasonable, mitigation measures will be included as part of the HST projects.

B4.2 Vibration Guidelines

To the extent they are feasible and reasonable, vibration mitigation measures may be applied at the source, along the path, or at the receiving building. However, the most effective measures are generally those that are applied at the source.

The Authority will use the following cost-benefit criteria to determine the reasonableness of implementing vibration mitigation:

The minimum length of track mitigated must be determined from calculations based on the FRA detailed analysis methods.

- The vibration mitigation treatment must provide a minimum of 3-VdB reduction for every impacted receiver to be considered effective.
- The Authority will apply the following formula to determine if the mitigation is cost-effective: Length x cost/foot divided by VdB reduction divided by the number of buildings benefitted. If this dollar amount exceeds \$45,000, the treatment is not considered to be cost-effective.

The cost-benefit criteria are designed to ensure that vibration mitigation is installed in areas where receivers would benefit significantly but not in areas where they would do little or no good.

B5.0 References Cited

Federal Railroad Administration (FRA). 2005. *High-Speed Ground Transportation Noise and Vibration Impact Assessment*. Final report. October.

Federal Transit Administration (FTA). 2006. *Transit Noise and Vibration Impact Assessment*. FTA-VA-90-1003-06. May.

Attachment C
Mitigation Measures:
Construction Noise and Vibration

C1.0 Mitigation Measures

C1.1 Mitigation Measures for Construction Noise and Vibration

C1.1.1 Construction Noise Mitigation Measures

Monitor construction noise to verify compliance with the limits. Provide the contractor the flexibility to meet the FTA construction noise limits in the most efficient and cost-effective manner. The contractor would have the flexibility of either prohibiting certain noise-generating activities during nighttime hours or providing additional noise control measures to meet the noise limits. To meet required noise limits, the following noise control mitigation measures will be implemented as necessary, for nighttime and daytime:

- Install a temporary construction site sound barrier near a noise source.
- Avoid nighttime construction in residential neighborhoods.
- Locate stationary construction equipment as far as possible from noise-sensitive sites.
- Re-route construction-related truck traffic along roadways that will cause the least disturbance to residents.
- During nighttime work, use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with spotters.
- Use low-noise emission equipment.
- Implement noise-deadening measures for truck loading and operations.
- Monitor and maintain equipment to meet noise limits.
- Line or cover storage bins, conveyors, and chutes with sound-deadening material.
- Use acoustic enclosures, shields, or shrouds for equipment and facilities.
- Use high-grade engine exhaust silencers and engine-casing sound insulation.
- Prohibit aboveground jackhammering and impact pile driving during nighttime hours.
- Minimize the use of generators to power equipment.
- Limit use of public address systems.
- Grade surface irregularities on construction sites.
- Use moveable sound barriers at the source of the construction activity.
- Limit or avoid certain noisy activities during nighttime hours.

To mitigate noise related to pile driving, the use of an augur to install the piles instead of a pile driver would reduce noise levels substantially. If pile driving is necessary, limit the time of day that the activity can occur.

C1.1.2 Construction Vibration Mitigation Measures

Building damage from construction vibration is only anticipated from impact pile driving at very close distances to buildings. If piling is more than 25 to 50 feet from buildings, or if alternative methods such as push piling or augur piling can be used, damage from construction vibration is not expected to occur. Other sources of construction vibration do not generate high enough vibration levels for damage to occur. When a construction scenario has been established, preconstruction surveys will be conducted at locations within 50 feet of piling to document the existing condition of buildings in case damage is reported during or after construction. Damaged buildings would be repaired or compensation paid.

C1.2 Mitigation Measures for Operational Noise and Vibration

C1.2.1 Operational Noise Mitigation Measures

Various options exist to address the potentially severe noise effects from HSTs. The mitigation measure or suite of mitigation measures for severe noise impacts shall be designed to reduce the noise level from HST operations from "severe" to "moderate" according to the provisions of the FRA noise and vibration manual (FRA 2005). With input from local jurisdictions and balancing technological factors, such as structural and seismic safety, cost, number of affected receptors, and effectiveness, mitigation measures would be selected and implemented from among the following:

- **Install sound barriers.** Depending on the height and location relative to the tracks, sound barriers can achieve between 5 and 15 dB of noise reduction. The primary requirements for an effective sound barrier are that the barrier must (1) be high enough and long enough to break the line-of-sight between the sound source and the receiver, (2) be of an impervious material with a minimum surface density of 4 pounds per square foot, and (3) not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, aesthetics, durability, cost, and maintenance considerations usually determine the selection of materials for sound barriers. Depending on the situation, sound barriers can become visually intrusive. Typically, the sound barriers style is selected with input from the local jurisdiction to reduce the visual effect of barriers on adjacent lands uses. For example, sound barriers could be solid or transparent, of various colors, materials, and surface treatments.
- The maximum sound barrier height would be 14 feet for at-grade sections; however, all sound barriers would be designed to be as low as possible while still achieving a substantial noise reduction. Berm and berm/wall combinations are the preferred types of sound barriers where space and other environmental constraints permit. On aerial structures, the maximum sound barrier height would also be 14 feet, but barrier material would be limited by engineering weight restrictions for barriers on the structure. Sound barriers on the aerial structure should still be designed to be as low as possible while still achieving a substantial noise reduction. Sound barriers on aerial structures and at-grade could consist of solid, semitransparent, and transparent materials.
- **Install building sound insulation.** Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction is a mitigation measure that can be provided when the use of sound barriers are not feasible in providing a reasonable level (5 to 7 dB) of noise reduction. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where sound barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dB) can often be achieved by adding an extra layer of glazing to windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air conditioning so that windows do not need to be opened. Establish performance criteria to balance existing noise events and ambient roadway noise conditions as factors for determining mitigation measures.
- **Acquire easements on properties severely affected by noise.** Another option for mitigating noise impacts is to acquire easements on residences likely to be impacted by HST operations by paying the homeowners to accept the future noise conditions. This approach is usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.

- **Vehicle noise specification.** In the procurement of an HST vehicle technology, the Authority will require bidders to meet the federal regulations (40 CFR Part 201.12/13) at the time of procurement for locomotives (currently a 90 dB level standard) and rail cars (currently a 93 dB level standard for cars operating at speeds of greater than 45 mph). Depending on the available technology, this could significantly reduce the number of impacts throughout the corridor.
- **Special trackwork at crossovers and turnouts.** Because the impacts of HST wheels over rail gaps at turnouts increases HST noise by approximately 6 dB over typical operations, turnouts can be a major source of noise impact. If the turnouts cannot be moved from sensitive areas, the project can use special types of trackwork that eliminate the gap.
- **Additional noise analysis during final design.** If final design of the track base or final vehicle specifications results in changes to the assumptions underlying the noise analysis, reassess noise impacts and recommendations for mitigation and provide supplemental environmental documentation, as required by CEQA and NEPA.
- **Heavy maintenance facilities measures.** In order to reduce the noise from the HMF, the follow noise mitigation measures are available:
 - Enclose as many of the maintenance activities within the facility as possible.
 - Eliminate windows in the maintenance building that would face toward noise sensitive land uses adjacent to the facility. If windows are required to be located on the side of the facility facing noise-sensitive land uses, they should be the fixed type of windows with a sound transmission class (STC) rating of at least 35. If the windows must of operable design, they should be closed during nighttime maintenance activities.
 - Close maintenance facility doors where the rails enter the facility during nighttime maintenance activities.
 - Maintenance tracks that cannot be located within the maintenance facility should be located on the far side of the facility from adjacent noise-sensitive receivers.
 - For maintenance tracks that cannot be installed away from noise-sensitive receivers, install noise barrier along the maintenance tracks in order to protect the adjacent to noise-sensitive receivers.
 - All mechanical equipment (compressors, pumps, generators, etc.) should be located within the maintenance facility structure.
 - Any mechanical equipment located exterior to the maintenance facility (compressors, pumps, generators, etc.) should be located on the far side of the facility from adjacent noise-sensitive receivers. If this is not possible, this equipment should be located within noise enclosures to mitigate the noise during operation.
 - All ventilation ducting for the maintenance facility should be pointed away from the adjacent noise-sensitive receivers.

C1.2.2 Operational Vibration Mitigation Measures

Implement Project Vibration Mitigation. Mitigation for operational vibration impacts can take place at the source, sensitive receiver, or along the propagation path from the source to the sensitive receiver. Measures include:

Vibration Mitigation Procedures and Descriptions

Mitigation Procedure	Location of Mitigation	Description
Location and Design of Special Trackwork	Source	Careful review of crossover and turnout locations during the preliminary engineering stage. When feasible, relocate special trackwork to a less vibration-sensitive area. Installation of spring frogs eliminates gaps at crossovers and helps reduce vibration levels.
Vehicle Suspension	Source	Rail vehicle should have low unsprung weight, soft primary suspension, minimum metal-on-metal contact between moving parts of the truck, and smooth wheels that are perfectly round.
Special Track Support Systems	Source	Floating slabs, resiliently supported ties, high resilience fasteners and ballast mats all help reduce vibration levels from track support system.
Building Modifications	Receiver	For existing buildings, if vibration-sensitive equipment is affected by train vibration, the floor upon which the vibration-sensitive equipment is located could be stiffened and isolated from the remainder of the building. For new buildings, the building foundation should be supported by elastomer pads similar to bridge bearing pads.
Trenches	Along Vibration Propagation Path	A trench can be an effective vibration barrier if it changes the propagation characteristics of the soil. It can be open or solid. Open trenches can be filled with materials such as styrofoam. Solid barriers can be constructed with sheet piling, rows of drilled shafts filled with either concrete or a mixture of soil and lime, or concrete poured into a trench.
Buffer Zones	Receiver	Negotiate a vibration easement from the affected property owners or expand rail right-of-way.

Attachment D
Highlighted Version of Appendix 3.7-A
Special-Status Species and Observed
Habitat

Attachment 1

Special-Status Plant Species with Potential to Occur in the Project Vicinity

Highlighted text indicates the alternatives and species associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Scientific Name Common Name	Federal Status ^a	State Status ^b	CNPS ^c	BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
Alismataceae											
<i>Sagittaria sanfordii</i> Sanford's arrowhead	--	--	List 1B.2	Low	Low	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Apiaceae											
<i>Eryngium spinosepalum</i> spiny-sepaled button-celery	--	--	List 1B.2	Moderate	Low	Low	Low	Moderate	Low	Low	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
Asteraceae											
<i>Cirsium crassicaule</i> slough thistle	--	--	List 1B.1	Moderate	Low	Low	Low	Moderate	Low	Low	Fresno: Low KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential

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<i>Heterotheca shevockii</i> Shevock's golden-aster	--	--	List 1B.3	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i> Coulter's goldfields	--	--	List 1B.1	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential

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<i>Layia heterotricha</i> pale-yellow layia	--	--	List 1B.1	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Layia leucopappa</i> Comanche Point layia	--	--	List 1B.1	Low	No Potential	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Layia munzii</i> Munz's tidy-tips	--	--	List 1B.2	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Monolopia congdonii</i> San Joaquin woolly threads	E	--	List 1B.2	Moderate	Low	Low	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential

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<i>Pseudobahia peirsonii</i> San Joaquin adobe sunburst	T	E	List 1B.1	Low	No Potential	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Stylocline citroleum</i> oil neststraw	--	--	List 1B.1	Low	No Potential	No Potential	No Potential	No Potential	No Potential	Low	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Stylocline masonii</i> Mason's neststraw	--	--	List 1B.1	Low	No Potential	No Potential	No Potential	No Potential	Low	Low	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: Low KCGSW: Low

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Brassicaceae											
<i>Caulanthus californicus</i> California jewel-flower	E	E	List 1B.1	Moderate	Low	Low	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Lepidium jaredii</i> ssp. <i>album</i> Panoche pepper-grass	--	--	List 1B.2	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: Low
<i>Tropidocarpum californicum</i> king's gold	--	--	List 1B.1	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Tropidocarpum capparideum</i> caper-fruited tropidocarpum	--	--	List 1B.1	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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Bryaceae											
<i>Schizymenium shevockii</i> Shevock's copper moss	--	--	List 1B.2	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Cactaceae											
<i>Opuntia basilaris</i> var. <i>treleasei</i> Bakersfield cactus	E	E	List 1B.1	Low	No Potential	No Potential	No Potential	No Potential	No Potential	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential
Campanulaceae											
<i>Downingia pusilla</i> dwarf downingia	--	--	List 2.2	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Chenopodiaceae											

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<i>Atriplex cordulata</i> heartscale	--	--	List 1B.2	High	Moderate	Low	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Atriplex coronata</i> var. <i>vallicola</i> Lost Hills crownscale	--	--	List 1B.2	High	Moderate	Low	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Atriplex depressa</i> brittlescale	--	--	List 1B.2	High	Moderate	Low	Low	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Atriplex erecticaulis</i> Earlimart orache	--	--	List 1B.2	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Fresno: Low KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential

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<i>Atriplex minuscula</i> lesser saltscall	--	--	List 1B.1	High	Moderate	Low	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Atriplex persistens</i> vernal pool smallscale	--	--	List 1B.2	Moderate	Low	Low	Low	Moderate	Low	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Atriplex subtilis</i> subtle orache	--	--	List 1B.2	High	Moderate	Low	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Atriplex tularensis</i> Bakersfield smallscale	--	E	List 1B.1	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential

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Euphorbiaceae											
<i>Chamaesyce hooveri</i> Hoover's spurge	T	--	List 1B.2	Moderate	Low	Low	Low	Moderate	Low	Low	Fresno: Low KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Chamaesyce hooveri</i> Hoover's spurge *Critical Habitat*	D	--	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Fabaceae											
<i>Astragalus hornii</i> var. <i>hornii</i> Horn's milk-vetch	--	--	List 1B.1	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential

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Geraniaceae											
<i>California macrophylla</i> round-leaved filaree	--	--	List 1B.1	Moderate	Low	Low	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
Hydrophyllaceae											
<i>Nama stenocarpum</i> mud nama	--	--	List 2.2	Low	Moderate	No Potential	No Potential	Low	Low	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Lamiaceae											
<i>Monardella linoides</i> ssp. <i>oblonga</i> flaxleaf monardella	--	--	List 1B.3	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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Liliaceae											
<i>Calochortus striatus</i> alkali mariposa-lily	--	--	List 1B.2	Moderate	Low	Low	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Fritillaria brandegeei</i> Greenhorn fritillary	--	--	List 1B.3	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Fritillaria striata</i> striped adobe-lily	--	T	List 1B.1	Low	No Potential	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential
Malvaceae											
<i>Eremalche kernensis</i> Kern mallow	E	--	List 1B.1	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential

Attachment 1

Special-Status Plant Species with Potential to Occur in the Project Vicinity

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Scientific Name Common Name	Federal Status ^a	State Status ^b	CNPS ^c	BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
Onagraceae											
<i>Clarkia tembloriensis</i> ssp. <i>calientensis</i> Vasek's clarkia	--	--	List 1B.1	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Papaveraceae											
<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i> Tejon poppy	--	--	List 1B.1	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Poaceae											
<i>Imperata brevifolia</i> California satintail	--	--	List 2.1	Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Orcuttia inaequalis</i> San Joaquin Valley Orcutt grass	T	E	List 1B.1	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential

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Special-Status Plant Species with Potential to Occur in the Project Vicinity

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<i>Orcuttia inaequalis</i> San Joaquin Valley Orcutt grass *Critical Habitat*	D	--	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Orcuttia pilosa</i> Hairy Orcutt grass	E	E	List 1B.1	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Orcuttia pilosa</i> Hairy Orcutt grass *Critical Habitat*	D	--	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Tuctoria greenei</i> Greene's tuctoria	E	R	List 1B.1	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: No Potential KCGSE: Low KCGSW: No Potential

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<i>Tuctoria greenei</i> Greene's tuctoria *Critical Habitat*	D	--	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Polemoniaceae											
<i>Eriastrum hooveri</i> Hoover's woolly-star	DL	--	List 4.2	Moderate	Moderate	Low	Low	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Leptosiphon serrulatus</i> Madera leptosiphon	--	--	List 1B.2	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Navarretia setiloba</i> Piute Mountains navarretia	--	--	List 1B.1	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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Scientific Name Common Name	Federal Status ^a	State Status ^b	CNPS ^c	BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
Polygonaceae											
<i>Eriogonum nortonii</i> Pinnacles buckwheat	--	--	List 1B.3	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Pottiaceae											
<i>Pterygoneurum californicum</i> California chalk moss	--	--	List 1B.1	Low	No Potential	No Potential	No Potential	Low	Low	Low	Fresno: No Potential KCH: No Potential KCGW: Low KCGSE: Low KCGSW: Low
<i>Tortula californica</i> California screw moss	--	--	List 1B.2	Low	No Potential	No Potential	No Potential	Low	Low	Low	Fresno: No Potential KCH: No Potential KCGW: Low KCGSE: Low KCGSW: Low

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Ranunculaceae											
<i>Delphinium purpusii</i> rose-flowered larkspur	--	--	List 1B.3	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Delphinium recurvatum</i> recurved larkspur	--	--	List 1B.2	High	High	Low	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
<i>Myosurus minimus</i> ssp. <i>apus</i> little mousetail	--	--	List 3.1	High	Low	Low	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: No Potential KCGSE: Low KCGSW: No Potential
Scrophulariaceae											
<i>Castilleja campestris</i> ssp. <i>succulenta</i> succulent owl's-clover	T	E	List 1B.2	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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<i>Castilleja campestris</i> ssp. <i>succulenta</i> succulent owl's-clover *Critical Habitat*	D	--	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Chloropyron molle</i> ssp. <i>hispidum</i> Hispid bird's-beak	--	--	1B.1	No potential	No potential	No potential	No potential	Low	Low	Low	Fresno: No Potential KCH: No Potential KCGW: Low KCGSE: Low KCGSW: Low
<i>Mimulus acutidens</i> Kings River monkeyflower	--	--	List 3	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Mimulus pictus</i> calico monkeyflower	--	--	List 1B.2	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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Violaceae											
<i>Viola pinetorum</i> ssp. <i>grisea</i> goosefoot yellow violet	--	--	List 1B.3	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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<p>Notes:</p> <p>Potential to occur designations:</p> <p>No potential: Outside of historic range or habitat absent from study area</p> <p>Low potential: Inside of present range and low or marginal quality habitat present within the study area</p> <p>Moderate potential: Within present range and suitable habitat present within the habitat study area</p> <p>High potential: Observed within habitat study area or recorded in the vicinity with supporting habitat present in Habitat Study Area</p> <p>-- = No status designation</p> <p>^a Federal status:</p> <p>E (Endangered) = Listed as endangered under the federal ESA.</p> <p>T (Threatened) = Listed as threatened under the federal ESA.</p> <p>DL (Delisted) = Delisted from the federal ESA.</p> <p>D (Designated) = Critical Habitat designated under the federal ESA</p> <p>^b State status:</p> <p>E (Endangered) = Listed as endangered under the CESA.</p> <p>T (Threatened) = Listed as threatened under the CESA.</p> <p>R (Rare) = Listed as rare under the CESA.</p>						<p>^c CNPS status:</p> <p>LIST 1A = Presumed extinct in California</p> <p>LIST 1B = Rare, threatened, or endangered in California and elsewhere</p> <p>LIST 2 = Rare, threatened, or endangered in California, but more common elsewhere</p> <p>LIST 3 = More information about this plant (Review List)</p> <p>LIST 4 = Plants of limited distribution (Watch List)</p> <p>-.1 = Seriously endangered in California; -.2 = Fairly endangered in California; -.3 = Not very endangered in California</p> <p>^d Heavy Maintenance Facility (HMF) Alternatives:</p> <p>Fresno: Fresno Works–Fresno HMF Site</p> <p>KCH: Kings County–Hanford HMF Site</p> <p>KCGW: Kern Council of Governments–Wasco HMF Site</p> <p>KCGSE: Kern Council of Governments–Shafter East HMF Site</p> <p>KCGSW: Kern Council of Governments–Shafter West HMF Site</p>					

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Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
Invertebrates										
Branchinecta conservatio CONSERVANCY FAIRY SHRIMP	E	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Branchinecta lynchi VERNAL POOL FAIRY SHRIMP	T	--	High	Moderate	Moderate	Moderate	High	Low	Low	Fresno: Moderate KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Branchinecta lynchi VERNAL POOL FAIRY SHRIMP *CRITICAL HABITAT*	D	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							Heavy Maintenance Facilities ^d
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	
<i>Desmocerus californicus dimorphus</i> VALLEY ELDERBERRY LONGHORN BEETLE	T	--	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Lepidurus packardii</i> VERNAL POOL TADPOLE SHRIMP	E	--	Low	Low	Low	Low	Low	Low	Low	Fresno: Moderate KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Lepidurus packardii</i> VERNAL POOL TADPOLE SHRIMP *CRITICAL HABITAT*	D	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Fish										
<i>Archoplites interruptus</i> SACRAMENTO PERCH	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Hypomesus transpacificus</i> DELTA SMELT	T	T	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Entosphenus hubbsi</i> KERN BROOK LAMPREY	--	SSC	Low	No Potential	No Potential	No Potential	No Potential	No Potential	Low	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Lampetra ayresi</i> RIVER LAMPREY	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Lavinia symmetricus symmetricus</i> SAN JOAQUIN ROACH	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Mylopharodon conocephalus</i> HARDHEAD	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Oncorhynchus mykiss</i> CENTRAL VALLEY STEELHEAD	T	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Amphibians										
<i>Ambystoma californiense</i> CALIFORNIA TIGER SALAMANDER	T	T/SSC	Low	Low	Low	Low	No Potential	No Potential	No Potential	Fresno: Low KCH: Low KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Ambystoma californiense</i> CALIFORNIA TIGER SALAMANDER *CRITICAL HABITAT*	D	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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<i>Batrachoseps simatus</i> KERN CANYON SLENDER SALAMANDER	--	T	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Batrachoseps stebbinsi</i> TEHACHAPI SLENDER SALAMANDER	C	T	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Ensatina eschscholtzii croceator</i> YELLOW-BLOTCHED SALAMANDER	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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<i>Lithobates (=Rana) pipiens</i> NORTHERN LEOPARD FROG *LIMITED TO* NATIVE POPULATIONS ONLY	C	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Rana boylei</i> FOOTHILL YELLOW- LEGGED FROG	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Rana draytonii</i> (<i>Rana aurora draytonii</i>) CALIFORNIA RED- LEGGED FROG	T	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							Heavy Maintenance Facilities ^d
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	
<i>Spea</i> (= <i>Scaphiopus</i>) <i>hammondi</i> WESTERN SPADEFOOT TOAD	--	SSC	High	Moderate	Moderate	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Low KCGSE: Moderate KCGSW: Low
Reptiles										
<i>Actinemys</i> (= <i>Clemmys</i> / <i>Emys</i>) <i>marmorata</i> WESTERN POND TURTLE	--	SSC	Moderate ^f	Moderate ^f	Moderate ^f	Moderate ^f	Moderate ^f	Moderate ^f	Moderate ^f	Fresno: Low ^f KCH: Low ^f KCGW: Low ^f KCGSE: Low ^f KCGSW: Low ^f
<i>Anniella pulchra</i> <i>pulchra</i> SILVERY LEGLESS LIZARD	--	SSC	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Moderate	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low

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<i>Gambelia</i> (= <i>Crotaphytus</i>) <i>silae</i> BLUNT-NOSED LEOPARD LIZARD	E	E/FP	High	No Potential	No Potential	No Potential	High	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: Low KCGSE: Moderate KCGSW: Low
<i>Masticophis</i> <i>flagellum ruddocki</i> SAN JOAQUIN WHIPSNAKE	--	SSC	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Phrynosoma</i> <i>blainvillii</i> COAST (CALIFORNIA) HORNED LIZARD	--	SSC	High	Moderate ^e	Moderate ^e	Moderate ^e	High ^e	No Potential	Moderate	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Salvadora hexalepis</i> <i>virgulata</i> COAST (WESTERN) PATCH-NOSED SNAKE	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Thamnophis gigas</i> GIANT GARTER SNAKE	T	T	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
Birds										
<i>Agelaius tricolor</i> TRICOLORED BLACKBIRD	--	SSC	High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Ammodramus savannarum</i> GRASSHOPPER SPARROW	--	SSC	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low

Attachment 2

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Aphelocoma insularis</i> ISLAND SCRUB-JAY	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Aquila chrysaetos</i> GOLDEN EAGLE	--	FP	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Asio flammeus</i> SHORT-EARED OWL	--	SSC	Low	Low	No Potential	No Potential	Low	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Asio otus</i> LONG-EARED OWL	--	SSC	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low

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			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Athene cunicularia</i> WESTERN BURROWING OWL	--	SSC	High	High	High	High	High	High	High	Fresno: High KCH: High KCGW: High KCGSE: High KCGSW: High
<i>Aythya americana</i> REDHEAD	--	SSC	High	Low	Moderate	High	Moderate	Low	Low	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low
<i>Baeolophus inornatus</i> OAK TITMOUSE	BCC	--	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Buteo swainsoni</i> SWAINSON'S HAWK	--	T	High	High	High	High	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate

Attachment 2

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Calidris canutus</i> RED KNOT (ROSELAARI SSP.)	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Calypte costae</i> COSTA'S HUMMINGBIRD	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Campylorhynchus brunneicapillus</i> CACTUS WREN	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Carduelis lawrencei</i> LAWRENCE'S GOLDFINCH	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

Attachment 2

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			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Charadrius alexandrinus nivosus</i> WESTERN SNOWY PLOVER *INLAND POPULATION*	--	SSC	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	No Potential	Fresno: No Potential KCH: No Potential KCGW: Moderate KCGSE: Moderate KCGSW: Low
<i>Charadrius montanus</i> MOUNTAIN PLOVER	--	SSC	Moderate	Moderate	No Potential	No Potential	Moderate	Low	Moderate	Fresno: No Potential KCH: No Potential KCGW: Low KCGSE: Low KCGSW: Low
<i>Chlidonias niger</i> BLACK TERN	--	SSC	Moderate	Moderate	No Potential	No Potential	Moderate	Moderate	Moderate	Fresno: No Potential KCH: No Potential KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Circus cyaneus</i> NORTHERN HARRIER	--	SSC	High	High	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Coccyzus americanus occidentalis</i> WESTERN YELLOW-BILLED CUCKOO	C	E	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Coturnicops noveboracensis</i> YELLOW RAIL	BCC	SSC	Moderate	Moderate	No Potential	No Potential	Moderate	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Cypseloides niger</i> BLACK SWIFT	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Dendragapus fuliginosus howardi</i> MOUNT PINOS SOOTY GROUSE	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

Attachment 2

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Dendrocygna bicolor</i> FULVOUS WHISTLING-DUCK	--	SSC	Moderate	Low	Low	Low	Moderate	Low	Moderate	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Dendroica petechia brewsteri</i> YELLOW WARBLER	--	SSC	Moderate	Moderate	Low	Low	Low	Low	Moderate	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low
<i>Elanus leucurus</i> WHITE-TAILED KITE	--	FP	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Empidonax trillii extimus</i> SOUTHWESTERN WILLOW FLYCATCHER	E	E	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Falco peregrinus anatum</i> AMERICAN PEREGRINE FALCON	Delisted	E/FP	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Geothlypis trichas</i> COMMON YELLOWTHROAT (SINUOSA SSP.)	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Grus canadensis canadensis</i> LESSER SANDHILL CRANE	--	SSC	High	Moderate	Moderate	Moderate	High	Moderate	Moderate	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low
<i>Grus canadensis tabida</i> GREATER SANDHILL CRANE	--	T/FP	High	Moderate	Moderate	Moderate	High	Moderate	Moderate	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Gymnogyps californianus</i> CALIFORNIA CONDOR	E•	E/FP	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Haematopus bachmani</i> BLACK OYSTERCATCHER	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Haliaeetus leucocephalus</i> BALD EAGLE	Delisted	E/FP	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Icteria virens</i> YELLOW-BREASTED CHAT	--	SSC	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							Heavy Maintenance Facilities ^d
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	
<i>Ixobrychus exilis</i> LEAST BITTERN	--	SSC	Moderate	Low	Low	Moderate	Moderate	Low	Low	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low
<i>Lanius ludovicianus</i> LOGGERHEAD SHRIKE	--	SSC	Moderate	High	Moderate	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Laterallus jamaicensis</i> BLACK RAIL	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Limnodromus griseus</i> SHORT-BILLED DOWITCHER	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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<i>Limosa fedoa</i> MARBLED GODWIT	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Melanerpes lewis</i> LEWIS'S WOODPECKER	BCC	--	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low
<i>Melospiza melodia</i> SONG SPARROW (GRAMINEA SSP.)	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Melospiza melodia</i> SONG SPARROW (MAXILLARIS SSP.)	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Melospiza melodia</i> SONG SPARROW (PUSILLULA SSP.)	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Melospiza melodia</i> SONG SPARROW (SAMUELIS SSP.)	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Numenius americanus</i> LONG-BILLED CURLEW	BCC	--	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Numenius phaeopus</i> WHIMBREL	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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<i>Oceanodroma homochroa</i> ASHY STORM- PETREL	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Otus flammeolus</i> FLAMMULATED OWL	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Passerculus sandwichensis beldingi</i> BELDING'S SAVANNAH SPARROW	--	E	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Pelecanus erythrorhynchos</i> AMERICAN WHITE PELICAN	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

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			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Phoebastria nigripes</i> BLACK-FOOTED ALBATROSS	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Pica nuttalli</i> YELLOW-BILLED MAGPIE	BCC	--	Low	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Picoides albolarvatus</i> WHITE-HEADED WOODPECKER	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Picoides nuttalli</i> NUTTALL'S WOODPECKER	BCC	--	Moderate	Moderate	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low

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			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Pipilo maculatus</i> SPOTTED TOWHEE (CLEMENTAE SSP.)	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Pooecetes gramineus affinis</i> OREGON VESPER SPARROW	--	SSC	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Progne subis</i> PURPLE MARTIN	--	SSC	Low	Low	Low	Low	Low	Low	Low	Fresno: Low KCH: Low KCGW: Low KCGSE: Low KCGSW: Low
<i>Ptychoramphus aleuticus</i> CASSIN'S AUKLET	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

Highlighted text indicates the alternatives and species associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Puffinus creatopus</i> PINK-FOOTED SHEARWATER	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Puffinus opisthomelas</i> BLACK-VENTED SHEARWATER	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Rynchops niger</i> BLACK SKIMMER	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Selasphorus sasin</i> ALLEN'S HUMMINGBIRD	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

Highlighted text indicates the alternatives and species associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Spizella atrogularis</i> BLACK-CHINNED SPARROW	BCC	--	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Sterna nilotica</i> GULL-BILLED TERN	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Strix occidentalis</i> SPOTTED OWL (OCCIDENTALIS SSP.)	BCC	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Synthliboramphus hypoleucus</i> XANTUS'S MURRELET	C/BCC	T	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

Highlighted text indicates the alternatives and species associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							Heavy Maintenance Facilities ^d
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	
<i>Toxostoma lecontei</i> LE CONTE'S THRASHER	--	SSC	Moderate	Moderate	No Potential	No Potential	Moderate	Moderate	Moderate	Fresno: No Potential KCH: No Potential KCGW: Low KCGSE: Low KCGSW: Low
<i>Vireo bellii pusillus</i> LEAST BELL'S VIREO	E	E	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Xanthocephalus xanthocephalus</i> YELLOW-HEADED BLACKBIRD	--	SSC	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
Mammals										
<i>Ammospermophilus nelsoni</i> NELSON'S (SAN JOAQUIN) ANTELOPE SQUIRREL	--	T	High	No Potential	No Potential	No Potential	High	Moderate	Moderate	Fresno: No Potential KCH: No Potential KCGW: Low KCGSE: Moderate KCGSW: Low

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

Highlighted text indicates the alternatives and species associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							Heavy Maintenance Facilities ^d
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South and Hybrid	
<i>Antrozous pallidus</i> PALLID BAT	--	SSC	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Bassariscus astutus</i> RINGTAIL	--	FP	High	No Potential	No Potential	No Potential	No Potential	No Potential	High	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Chaetodipus californicus femoralis</i> DULZURA POCKET MOUSE	--	SSC	Moderate	No Potential	No Potential	No Potential	Moderate	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: Low KCGSE: Moderate KCGSW: Low
<i>Corynorhinus townsendii</i> TOWNSEND'S BIG-EARED BAT	--	SSC	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Dipodomys ingens</i> GIANT KANGAROO RAT	E	E	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Dipodomys nitratoides brevinasus</i> SHORT-NOSED KANGAROO RAT	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Dipodomys nitratoides exilis</i> FRESNO KANGAROO RAT	E	E	Low	Low	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: Low KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Dipodomys nitratoides nitratoides</i> TIPTON KANGAROO RAT	E	E	High	No Potential	No Potential	No Potential	High	Moderate	Moderate	Fresno: No Potential KCH: Moderate KCGW: Low KCGSE: Moderate KCGSW: Low

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Euderma maculatum</i> SPOTTED BAT	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Eumops perotis californicus</i> WESTERN MASTIFF BAT	--	SSC	Moderate	No Potential	No Potential	No Potential	No Potential	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Lasiurus blossevillei</i> WESTERN RED BAT	--	SSC	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Moderate KCGSE: Moderate KCGSW: Moderate
<i>Onychomys torridus ramona</i> SOUTHERN GRASSHOPPER MOUSE	--	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d
<i>Onychomys torridus</i> <i>tularensis</i> TULARE GRASSHOPPER MOUSE	--	SSC	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Low KCGSE: Moderate KCGSW: Low
<i>Sorex ornatus</i> <i>relictus</i> BUENA VISTA LAKE SHREW	E	SSC	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	No Potential	Fresno: No Potential KCH: No Potential KCGW: No Potential KCGSE: No Potential KCGSW: No Potential
<i>Taxidea taxus</i> AMERICAN BADGER	--	SSC	High	Moderate	Moderate	Moderate	High	Moderate	Moderate	Fresno: Moderate KCH: Moderate KCGW: Low KCGSE: Moderate KCGSW: Low
<i>Vulpes macrotis</i> <i>mutica</i> SAN JOAQUIN KIT FOX	E	T	High	High	High	Moderate	High	Moderate	High	Fresno: Low KCH: Moderate KCGW: Moderate KCGSE: High KCGSW: High

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a							
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid	Heavy Maintenance Facilities ^d

Notes:

-- = No status designation.

^a **Basis for Potential to Occur Determination:**

No Potential = Outside of species' historical range or inside of the species' historical range, but outside of the species' present range.

Low = Inside of the species' present range, but no suitable habitat is present within the project footprint OR

Inside of the species' present range and suitable habitat is/is not present, but species is considered extirpated OR

Inside of the species' present range and suitable habitat is present but urbanization (e.g. city of Fresno) is expected to preclude the species' presence

Moderate = Inside of the species' historical and present range and suitable habitat is present

High = Inside of the species' historical and present range and CNDDDB observation/URS observation/state and/or federal wildlife preserves and refuges adjacent to or inside the footprint OR

In the case of bird species, inside of the species' historical and present range and CNDDDB observation/URS *nesting* observation/state and appropriate federal wildlife preserves and refuges adjacent to or inside the footprint

Attachment 2

Special-Status Wildlife Species with Potential to Occur in the Project Vicinity

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Scientific Name Common Name	Federal Status ^b	State Status ^c	Potential to Occur ^a						
			BNSF Alternative	Hanford West Bypass (All)	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco- Shafter Bypass	Bakersfield South and Hybrid
^b Federal status: E (Endangered) = Listed as endangered under Federal ESA. T (Threatened) = Listed as threatened under the Federal ESA. BCC (Birds of Conservation Concern) C (Candidate) = Listed as candidate under the Federal ESA. D (Designated) = Critical Habitat designated under the federal ESA ^c State status: E (Endangered) = Listed as endangered under the CESA. T (Threatened) = Listed as threatened under the CESA. R (Rare) = Listed as rare under the CESA FP (Fully Protected) = Classified as fully protected by CDFG SSC (California Species of Special Concern) = Listed as a Species of Special Concern by CDFG ^d Heavy Maintenance Facility (HMF) Alternatives: Fresno: Fresno Works–Fresno HMF Site KCH: Kings County–Hanford HMF Site KCGW: Kern Council of Governments–Wasco HMF Site KCGSE: Kern Council of Governments–Shafter East HMF Site KCGSW: Kern Council of Governments–Shafter West HMF Site ^e The coast horned lizard was observed in the Allensworth Bypass Alternative during the 2010 field surveys; due to these observations, the species’ range has been extended beyond the range map provided by the CWHR to include both the Corcoran Elevated, Corcoran Bypass, and Allensworth Bypass alternatives because of the presence of natural habitat areas in these alternatives. ^f The potential for western pond turtle was determined as follows: Moderate = RIV+(AGS, FEW, LAC, PAS, URB, VRI) and within the species’ range; Low = AGS, FEW, LAC, PAS, and URB and within the species’ range. Source: USFWS 1998, 2005, and 2008.									

Attachment 3

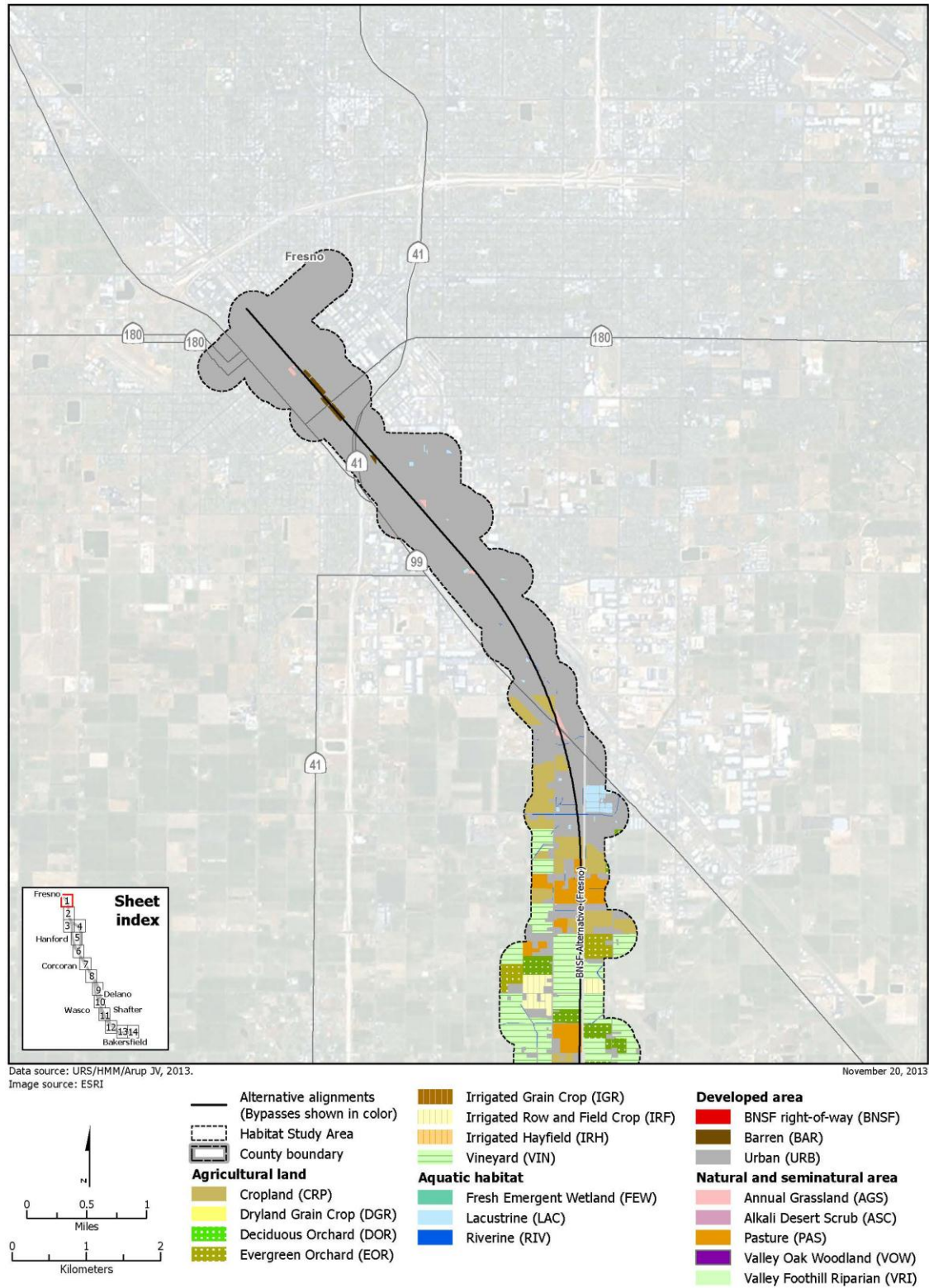


Figure A3-1a
Observed Habitats within the Habitat Study Area

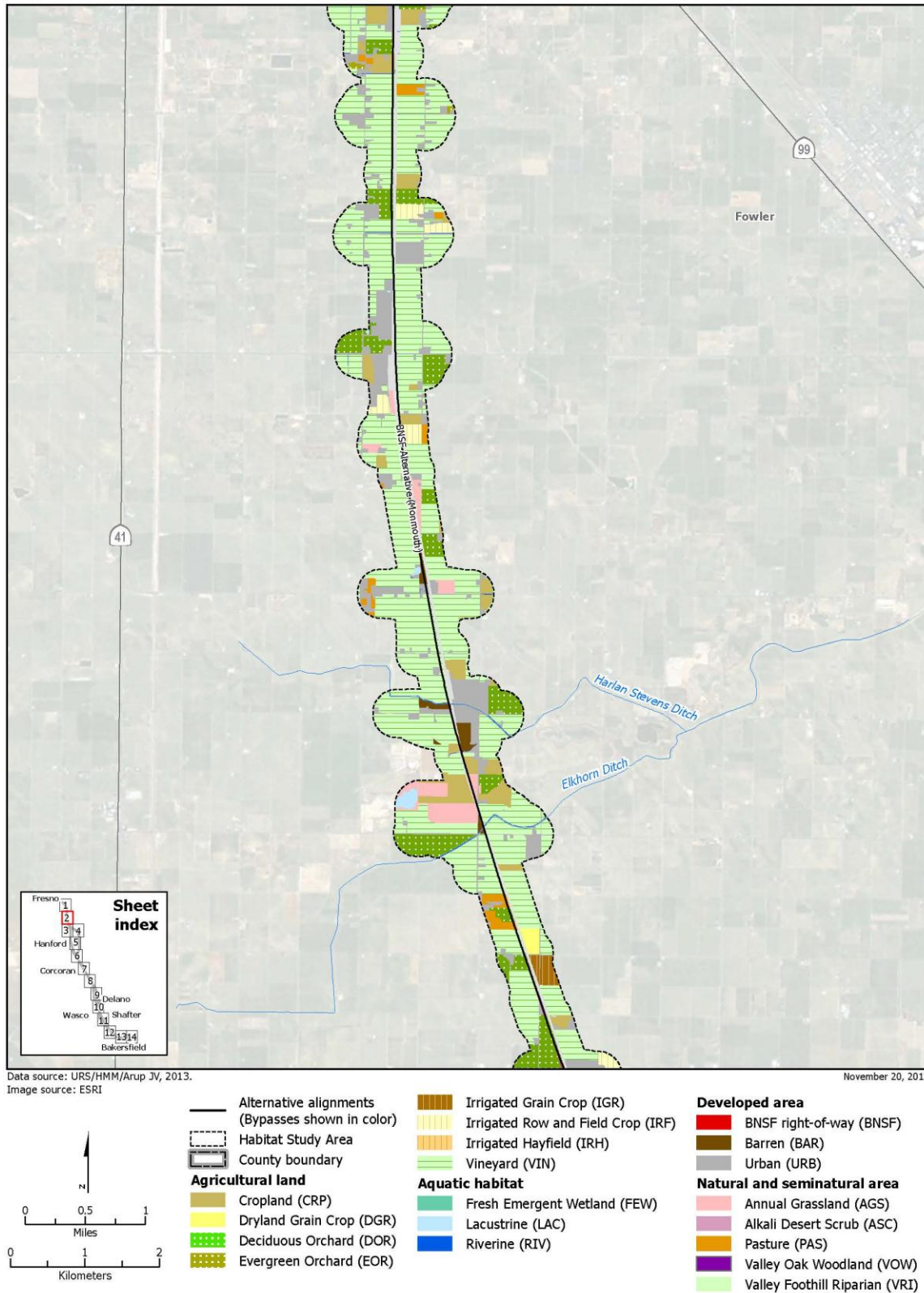


Figure A3-1b
Observed Habitats within the Habitat Study Area

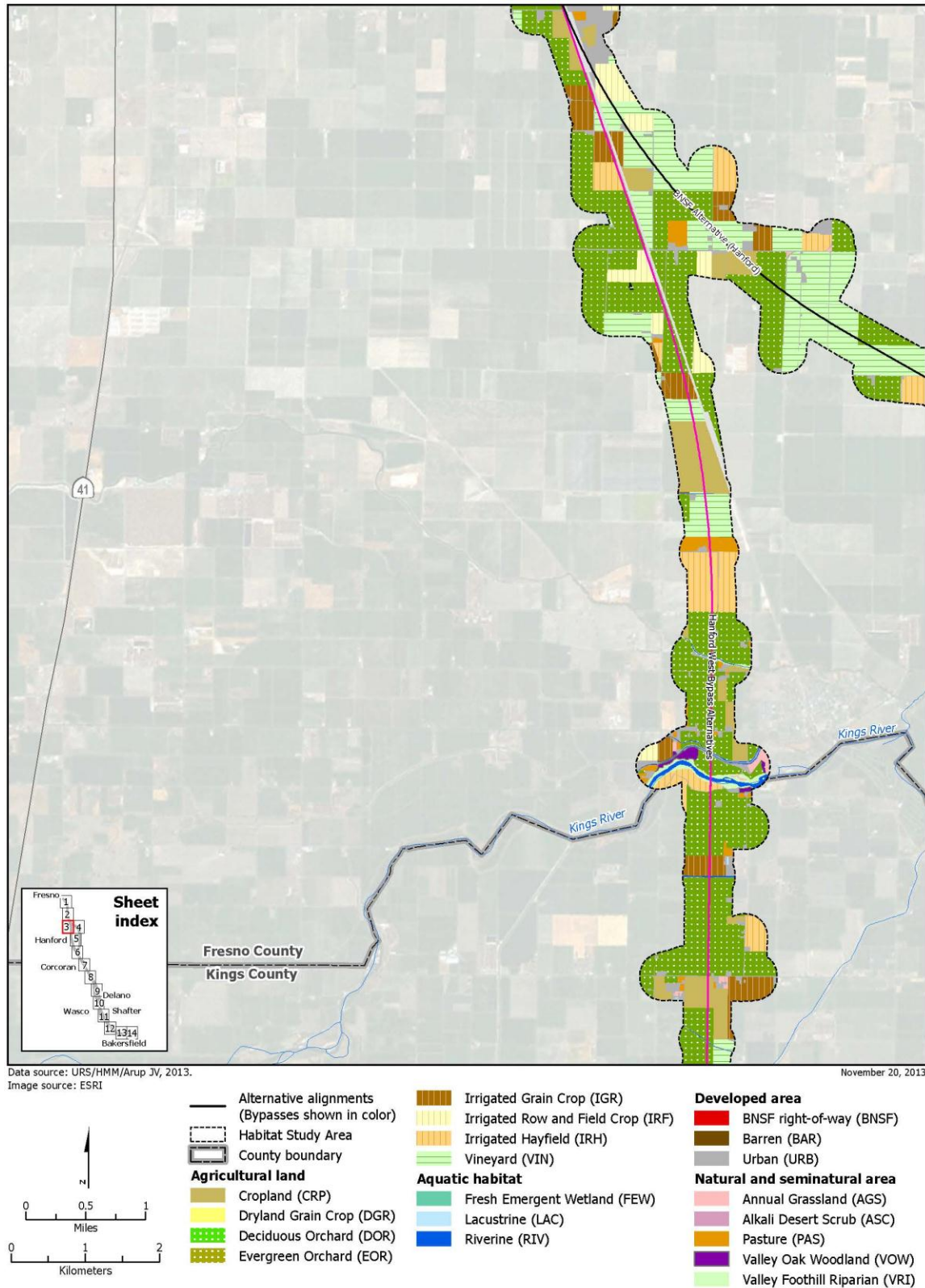


Figure A3-1c
Observed Habitats within the Habitat Study Area

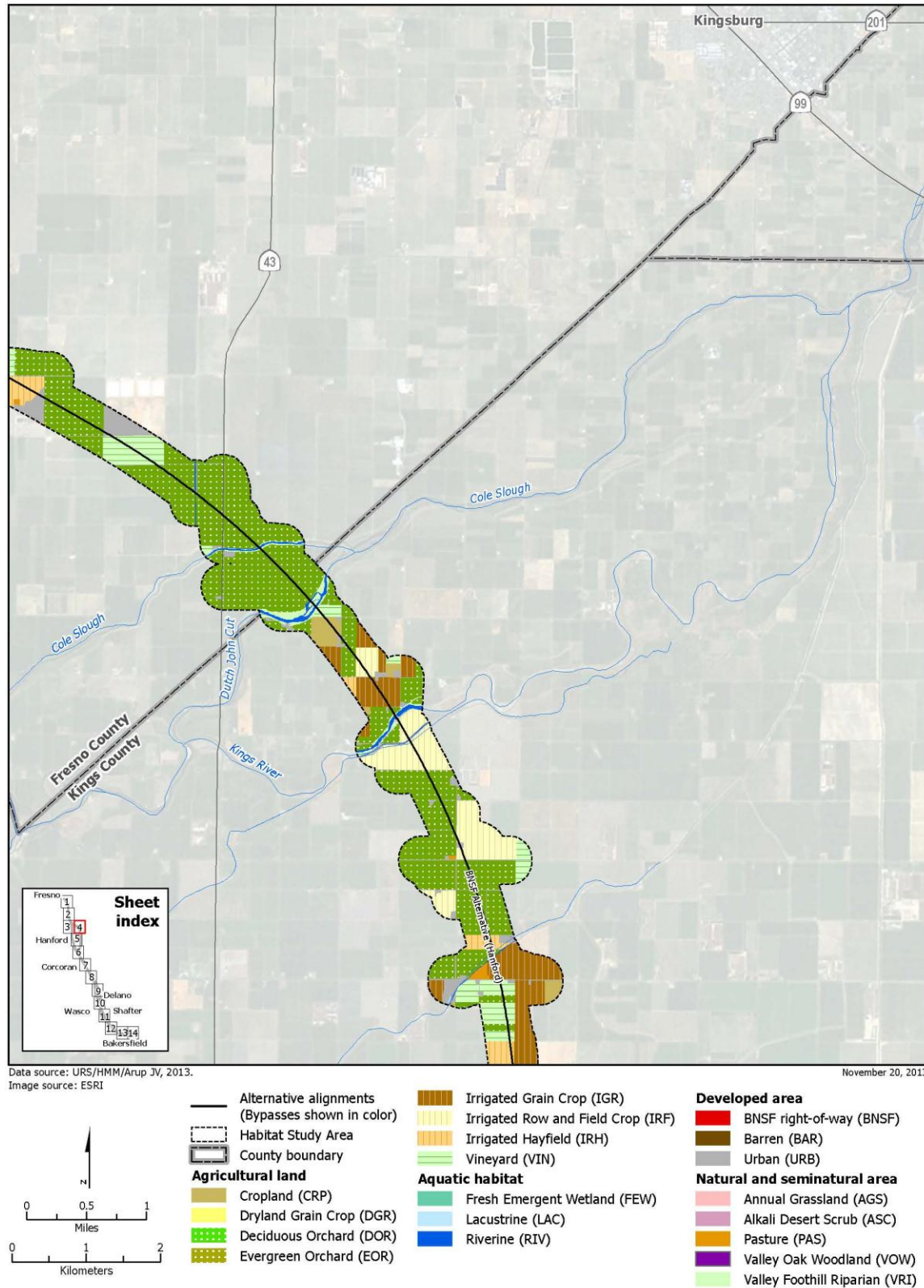


Figure A3-1d
Observed Habitats within the Habitat Study Area

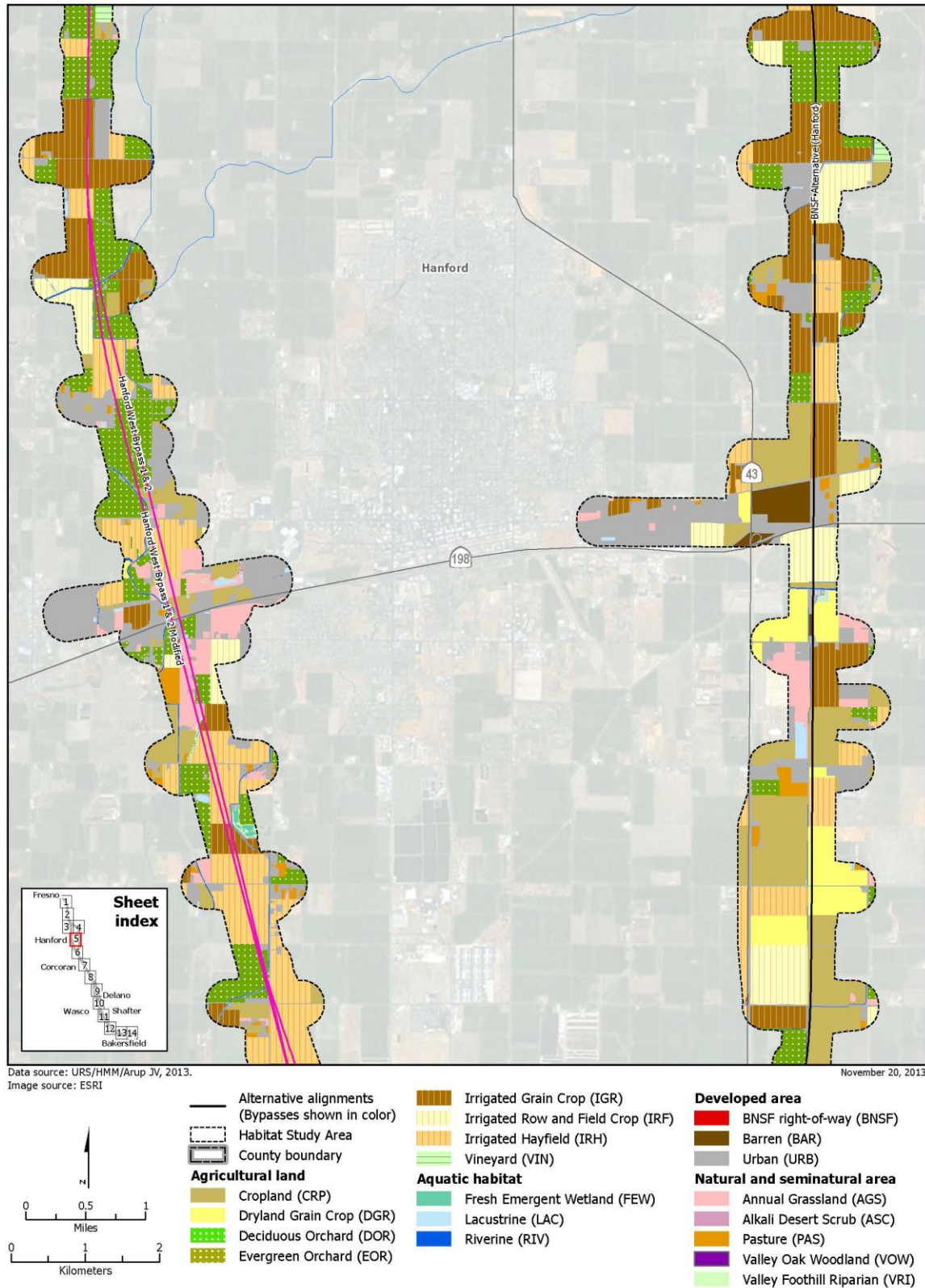


Figure A3-1e
Observed Habitats within the Habitat Study Area

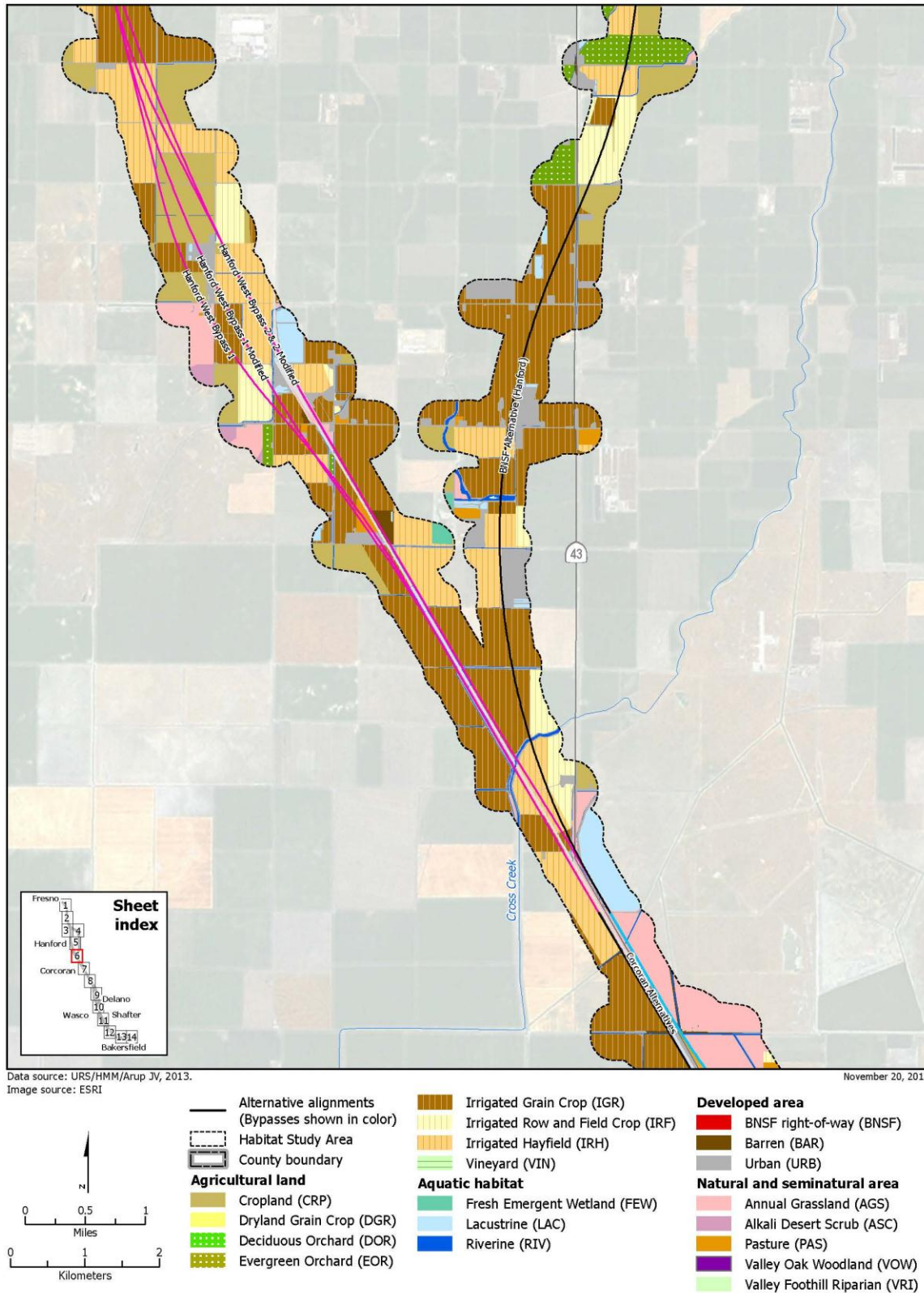


Figure A3-1f
Observed Habitats within the Habitat Study Area

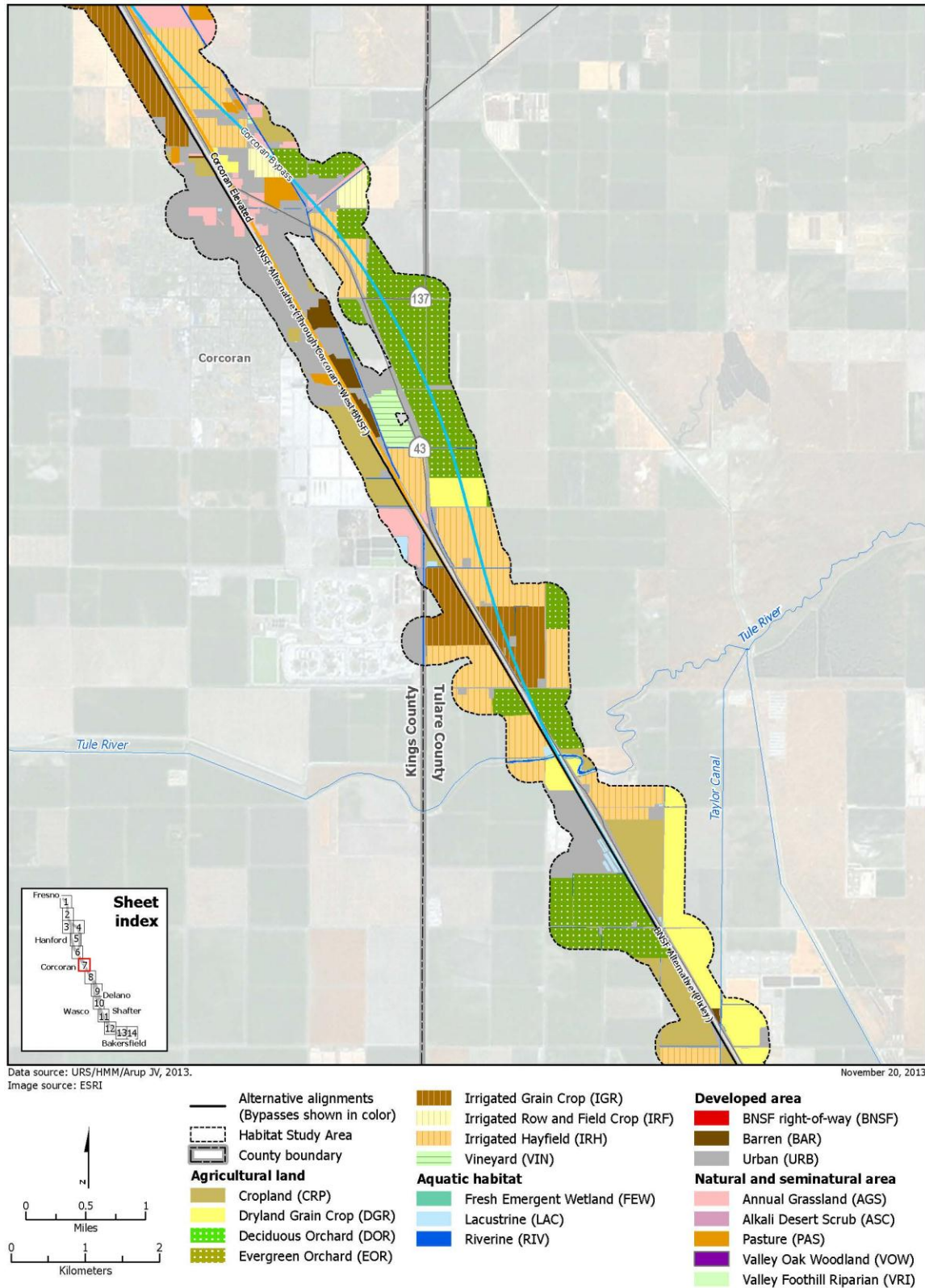


Figure A3-1g
Observed Habitats within the Habitat Study Area

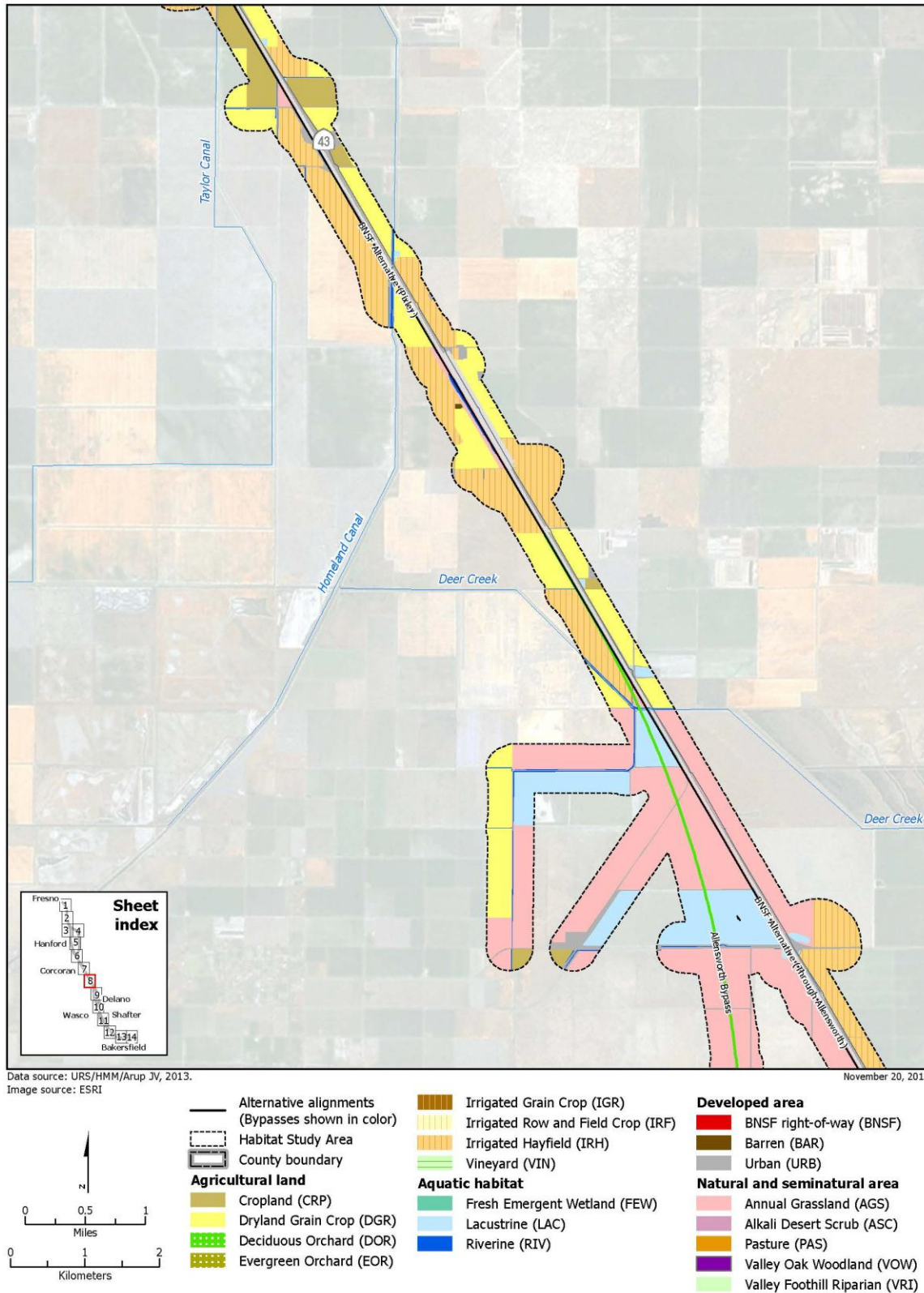


Figure A3-1h
Observed Habitats within the Habitat Study Area

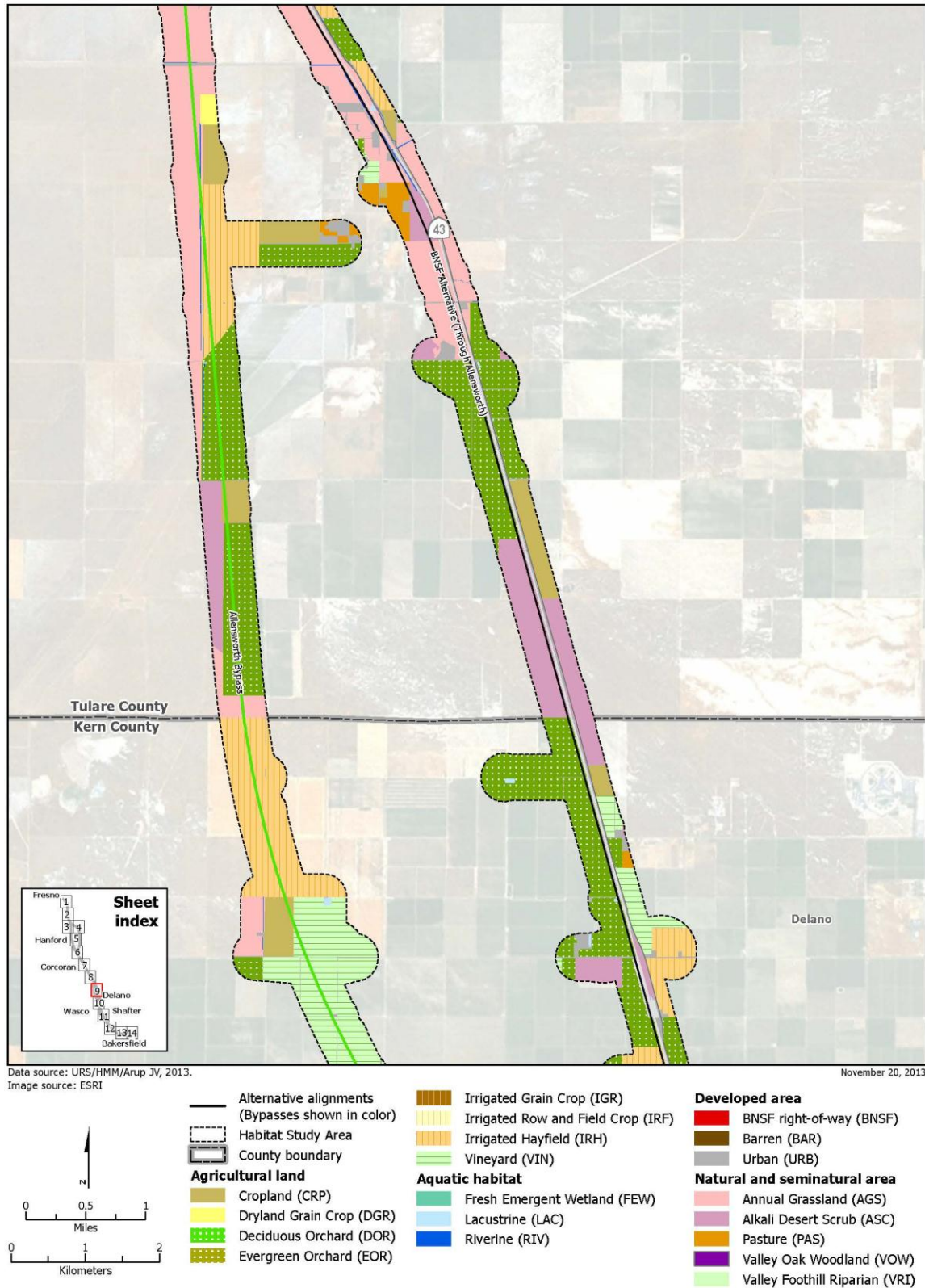


Figure A3-1i
Observed Habitats within the Habitat Study Area

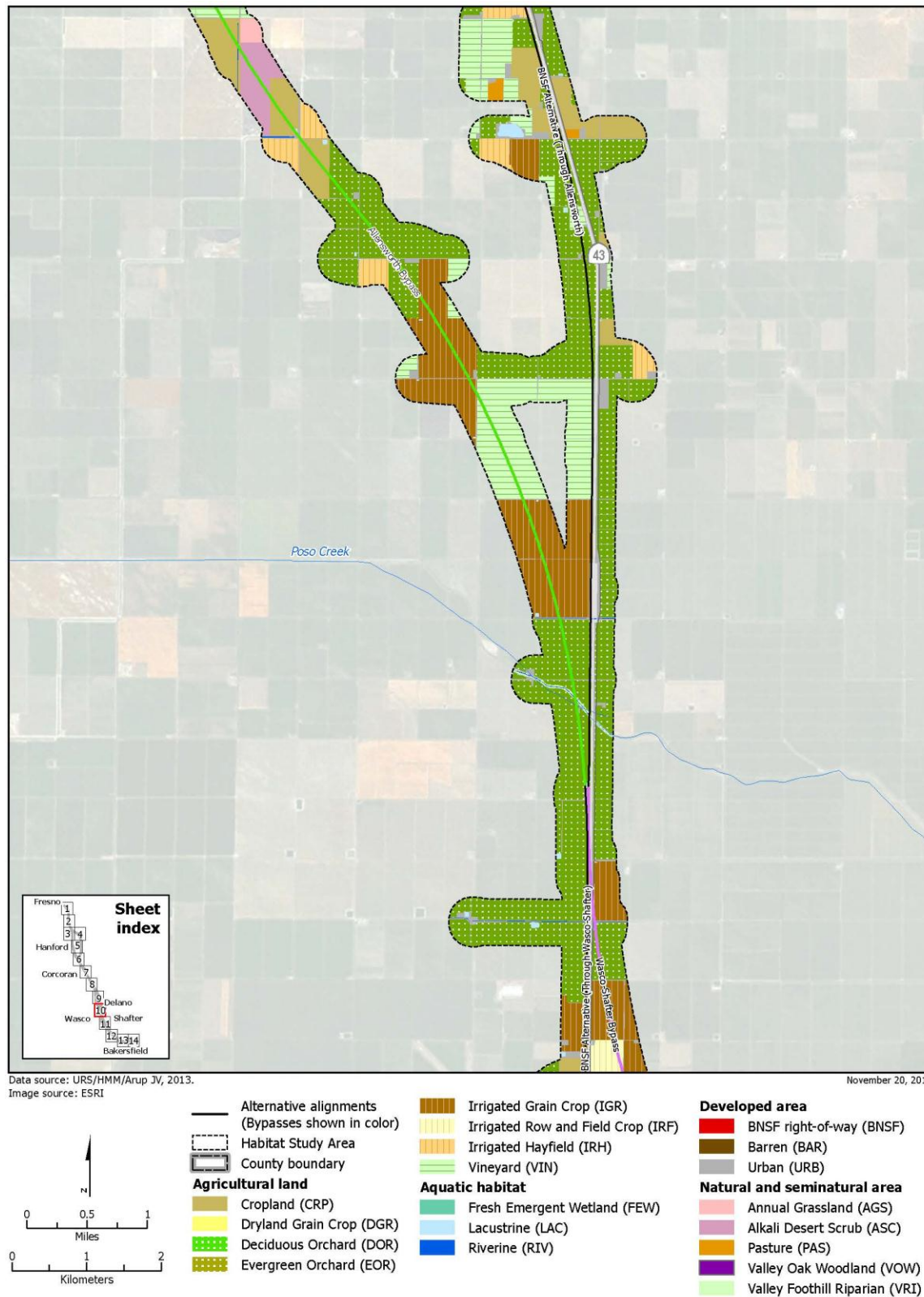


Figure A3-1j
Observed Habitats within the Habitat Study Area

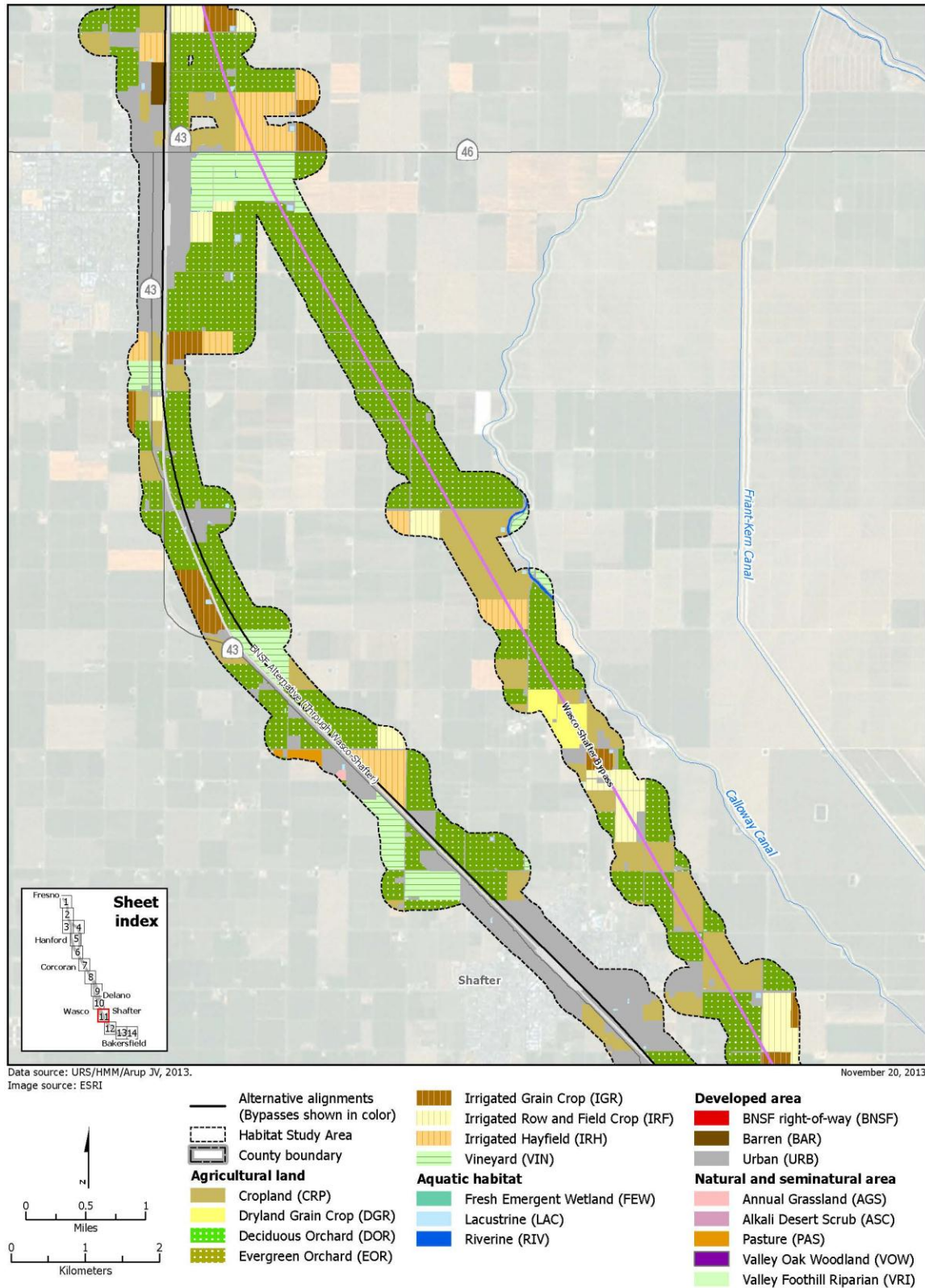


Figure A3-1k
Observed Habitats within the Habitat Study Area

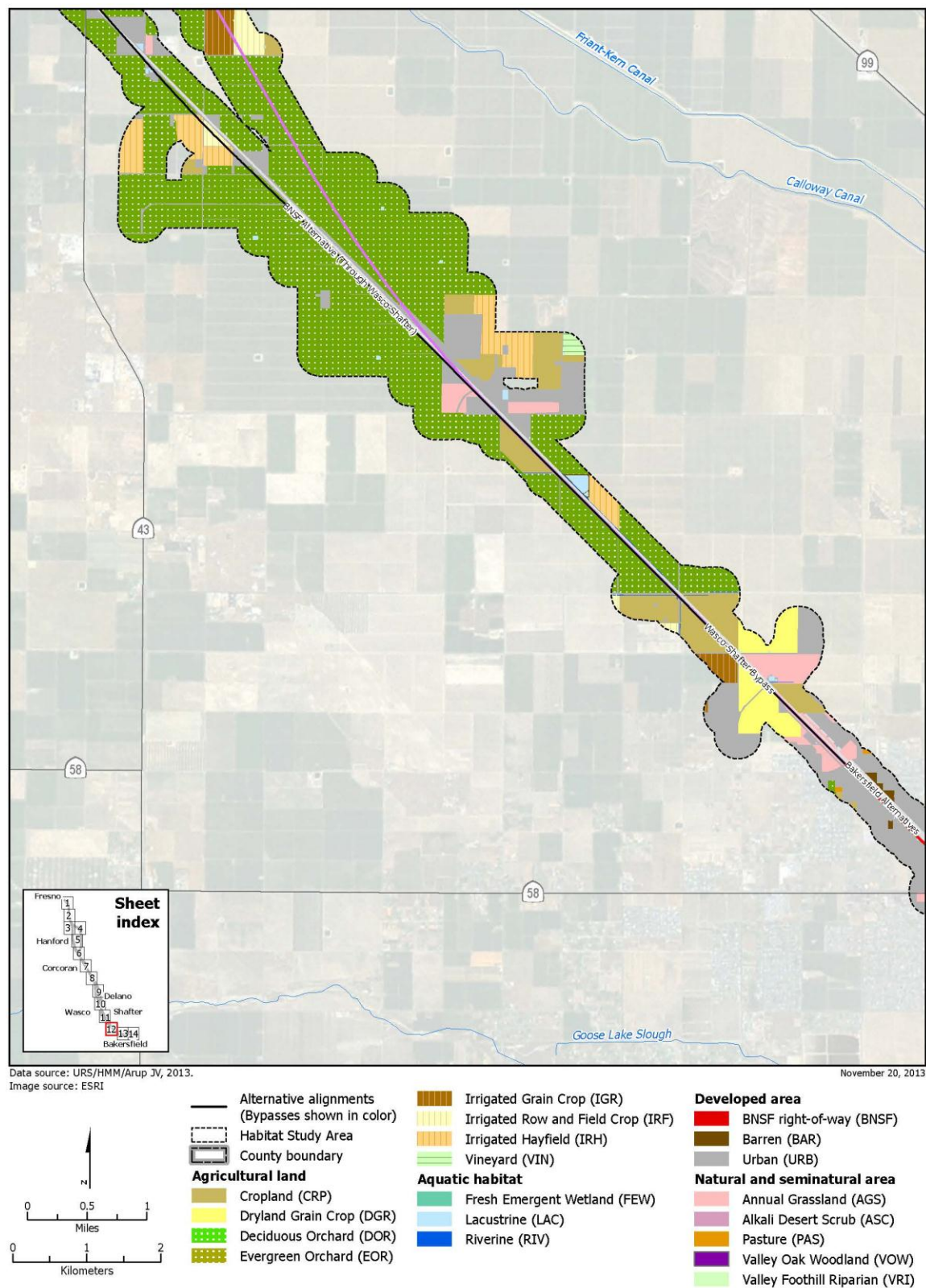


Figure A3-11
Observed Habitats within the Habitat Study Area

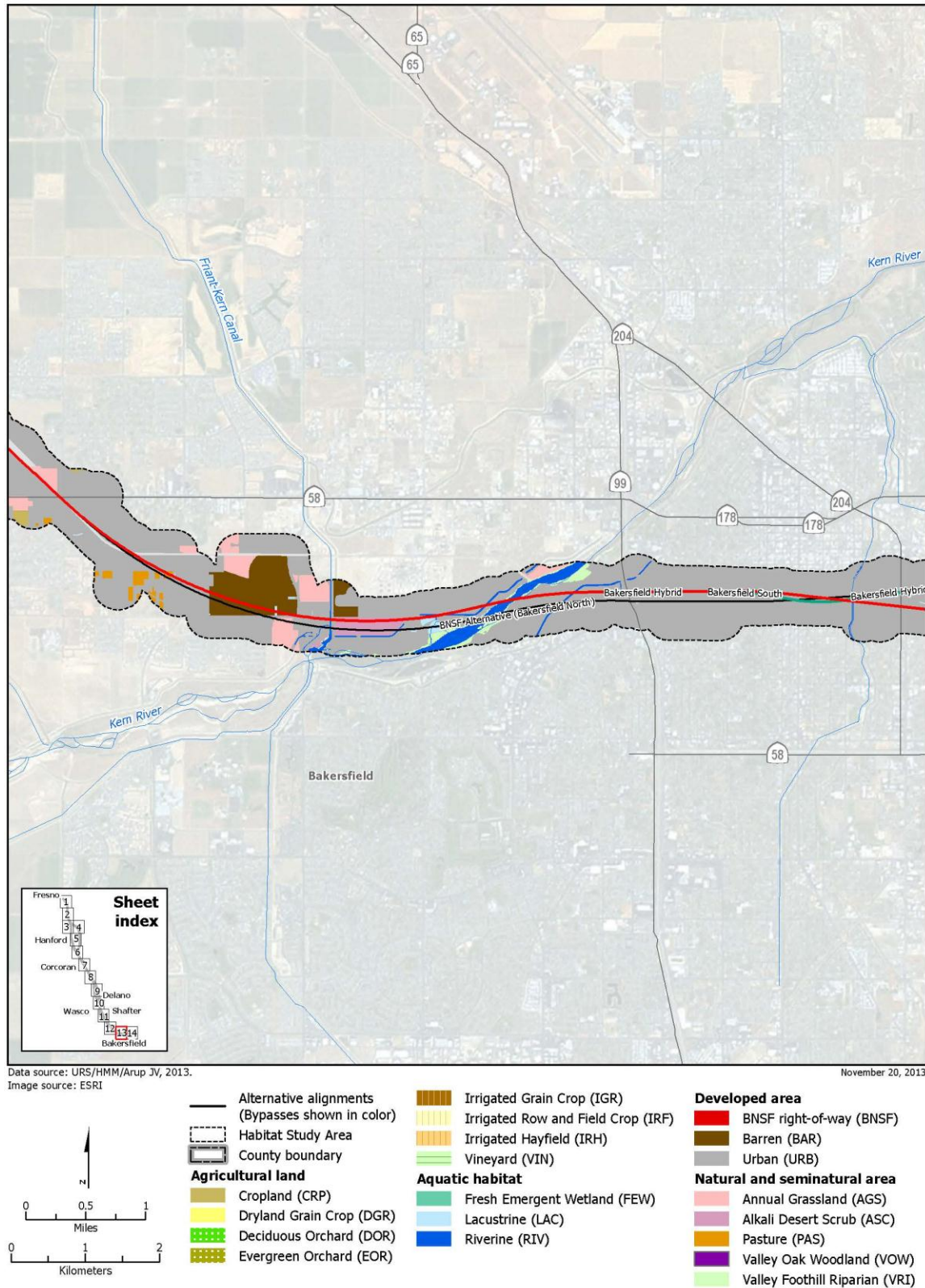


Figure A3-1m
Observed Habitats within the Habitat Study Area

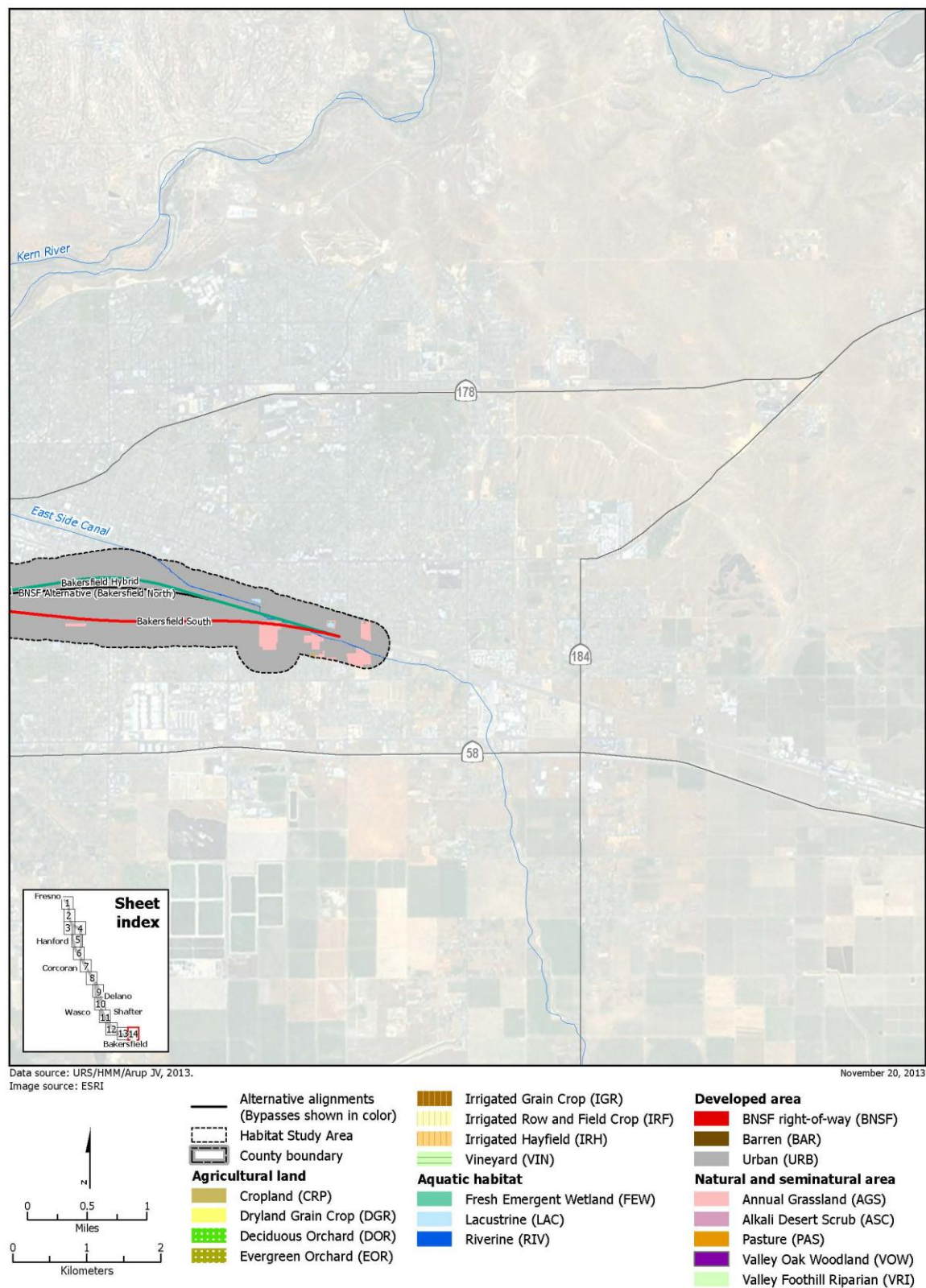


Figure A3-1n
Observed Habitats within the Habitat Study Area

Attachment E
Highlighted Version of Appendix 3.7-B
Comparison of Impacts on Biological
Resources by Alternative

Explanation of the Impact Comparison Tables

For each biological resource type (e.g., special-status plant species, special-status wildlife species), a table has been produced to report the acres of impact resulting from construction and project-related activities. The tables are formatted as follows:

- The column labeled "BNSF Impact Acreage" presents the acres of impact for the entire BNSF Alternative.
- The columns labeled as alternative alignments segments (e.g., Hanford West Bypass 1—At-grade) present two values for each alternative alignment. The value to the left of the slash is the acres of impact within that alternative alignment alone. The number to the right of the slash represents the "Difference Compared with Corresponding BNSF Area." This value represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative. Positive (+) differences indicate that the alternative alignment results in a greater number of impact acres than its corresponding segment in the BNSF Alternative. Negative (-) differences indicate that the alternative alignment results in a smaller number of impact acres than its corresponding segment in the BNSF Alternative.

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Attachment 1
Comparison of Impacts on Special-Status Plant Species by Alternative

Highlighted text indicates the alternatives and species associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Special-Status Plant Species (Common Name/Scientific Name/Status)	Impact Type	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area ^a									
Heartscale <i>Atriplex cordulata</i> CNPS 1B.2	Project	0.67	—	—	—	—	—	0.004 / +0.004	— / -0.63	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Little mouse tail <i>Myosurus minimus</i> ssp. <i>apus</i> CNPS 3.1	Project	0.48	—	—	—	—	—	—	— / -0.21	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Unsurveyed potential suitable habitat that could support special-status plant species	Project	401.31	42.94 / +0.56	50.96 / +8.59	55.26 / +12.88	88.31 / +45.94	125.98 / +88.00	112.25 / +74.27	159.71 / -45.13	32.48 / +9.98	42.65 / +11.69	39.64 / +8.68
	Construction	241.47	15.13 / +11.36	10.43 / +6.65	31.20 / +27.43	8.64 / +4.86	2.63 / -2.47	9.86 / +4.76	64.97 / +60.56	24.95 / +14.33	202.03 / -6.71	205.05 / -3.68
Total Impacts	Project	402.45	42.94 / +0.56	50.96 / +8.59	55.26 / +12.88	88.31 / +45.94	125.99 / +88.01	112.25 / +74.27	159.71 / -45.97	32.48 / +9.98	42.65 / +11.69	39.64 / +8.68
	Construction	241.47	15.13 / +11.36	10.43 / +6.65	31.20 / +27.43	8.64 / +4.86	2.63 / -2.47	9.86 / +4.76	64.97 / +60.56	24.95 / +14.33	202.03 / -6.71	205.05 / -3.68
<p>Notes:</p> <p>— = No impact or not applicable</p> <p>^a The “Difference Compared to Corresponding BNSF Area” represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.</p> <p>Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.</p> <p>All impacts were calculated based on 15% engineering design construction footprint.</p> <p>CNPS Status</p> <p>1B: Rare, threatened, or endangered in California and elsewhere</p> <p>2: Rare, threatened, or endangered in California, but more common elsewhere</p> <p>3: More information is needed</p> <p>4: Limited distribution or infrequent throughout California</p> <p>0.1: Seriously endangered in California</p> <p>0.2: Fairly endangered in California</p> <p>0.3: Not very endangered in California</p> <p>Abbreviations:</p> <p>CNPS = California Native Plant Society</p>												

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Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Highlighted text indicates the alternatives and species associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives										
			BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area ^a									
Federally and State-Listed Species													
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>) FT	Vernal pools/seasonal wetlands	Project	16.49	0.01 / +0.01	0.27 / +0.27	—	0.27 / +0.27	1.21 / -0.39	1.34 / -0.27	6.02 / -7.1	—	0.51 / -0.11	0.51 / -0.11
		Construction	1.73	0.05 / +0.05	—	0.04 / +0.04	—	1.91 / +1.24	0.07 / -0.61	0.03 / -0.55	—	—	—
		Indirect	98.81	1.11 / +0.69	1.23 / +0.81	1.12 / +0.70	1.22 / +0.80	6.68 / -0.84	1.34 / -6.18	31.45 / -48.91	—	0.09 / -0.04	0.09 / -0.04
Valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>) FT	Elderberry shrubs (<i>Sambucus</i> spp.)	Project	1	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —
		Construction	—	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —	(P) —
Vernal pool tadpole shrimp (<i>Lepidurus packardii</i>) FE	Vernal pools/seasonal wetlands	Project	16.49	0.01 / +0.01	0.27 / +0.27	—	0.27 / +0.27	1.21 / -0.39	1.34 / -0.27	6.02 / -7.1	—	0.51 / -0.11	0.51 / -0.11
		Construction	1.73	0.05 / +0.05	—	0.04 / +0.04	—	1.91 / +1.24	0.07 / -0.61	0.03 / -0.55	—	—	—
		Indirect	98.81	1.11 / +0.69	1.23 / +0.81	1.12 / +0.70	1.22 / +0.80	6.68 / -0.84	1.34 / -6.18	31.45 / -48.91	—	0.09 / -0.04	0.09 / -0.04
California tiger salamander (<i>Ambystoma californiense</i>) FT, ST	Aquatic: man-made lacustrine feature in Corcoran Irrigation Water District	Project	16.82	— / -16.82	— / -16.82	3.96 / -12.86	18.14 / +1.32	—	—	— ^c	— ^c	— ^c	— ^c
		Construction	—	—	—	14.18 / +14.18	—	—	—	— ^c	— ^c	— ^c	— ^c
	UPLAND: ASC, AGS, PAS, VOW surrounding vernal pools/seasonal wetlands in Corcoran Irrigation Water District ^d	Project	15.12	— / -15.1	<0.01 / -15.1	4.46 / -10.64 ^d	6.77 / -8.34 ^d	2.40 / +2.38	4.93 / +4.91	— ^c	— ^c	— ^c	— ^c
		Construction	0.02	0.01 / -0.01	— / -0.02	2.32 / +2.30 ^d	0.05 / +0.03 ^d	—	—	— ^c	— ^c	— ^c	— ^c
Blunt-nosed leopard lizard (<i>Gambelia</i> [= <i>Crotaphytus</i>] <i>sila</i>) FE, SE/FP	ASC, AGS, BAR, VRI	Project	104.77	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	33.67 / -71.10	— ^c	— ^c	— ^c
		Construction	2.19	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	2.07 / -0.12	— ^c	— ^c	— ^c
Golden eagle (<i>Aquila chrysaetos</i>) FP	ASC, AGS, BAR, CRP, FEW, IRH, PAS, URB, VRI, VOW	Project	2521.68	510.55 / +42.60	539.99 / +72.04	556.22 / +88.27	603.91 / +135.96	333.54 / +76.27	326.59 / +69.33	282.16 / -43.47	318.67 / -170.25	279.96 / -31.51	260.63 / -50.84
		Construction	1213.19	85.21 / -328.08	75.88 / -337.41	94.38 / -318.91	142.59 / -270.70	222.76 / +15.67	202.37 / -4.73	82.62 / +31.71	92.68 / -30.66	271.65 / +2.13	293.99 / +24.46

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Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives										
			BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area ^a									
Swainson's hawk (<i>Buteo swainsoni</i>) ST	AGS, BAR, CRP, IRH, PAS, URB, VRI, VOW	Project	2467.46	510.55 / +42.60	539.99 / +72.04	556.22 / +88.27	603.91 / +135.96	333.54 / +76.27	326.59 / +69.33	274.48 / -9.82	318.67 / -170.25	268.27 / -30.32	248.93 / -49.66
		Construction	1210.07	85.21 / -328.08	75.88 / -337.41	94.38 / -318.91	142.59 / -270.70	222.76 / +15.67	202.37 / -4.73	82.62 / +32.29	92.68 / -30.66	268.97 / +1.99	291.30 / +24.32
Western snowy plover (<i>Charadrius alexandrinus nivosus</i>) FT, CSC	LAC	Project	57.27	0.12 / -18.07	0.12 / -18.06	4.26 / -13.92	19.83 / +1.65	8.85 / -0.49	8.73 / -0.60	26.79 / +0.09	1.71 / -0.41	—	—
		Construction	7.38	—	—	15.79 / +15.79	1.76 / +1.76	— / -0.03	0.01 / -0.02	1.60 / -3.67	0.49 / -1.60	—	—
White-tailed kite (<i>Elanus leucurus</i>) FP	ASC, AGS, CRP, BAR, DOR, DGR, EOR, FEW, IRH, IRF, IGR, URB, VRI, VIN, VOW	Project	4583.01	927.90 / -267.53	989.03 / -206.40	934.00 / -261.43	1056.66 / -138.76	411.37 / -1.65	452.62 / +39.59	552.27 / -77.24	733.93 / -254.07	278.32 / -32.00	258.99 / -51.33
		Construction	2178.78	154.29 / -431.10	147.35 / -438.05	159.11 / -426.28	218.84 / -366.55	380.53 / +15.25	366.22 / +0.94	157.25 / +3.57	392.11 / -254.56	271.57 / +2.15	293.90 / +24.48
American peregrine falcon (<i>Falco peregrinus anatum</i>) Delisted, SE/FP	AGS, BAR, CRP, FEW, IGR, IRH, LAC, RIV, URB, VRI, VOW	Project	3022.59	703.66 / -72.90	731.97 / -44.58	714.01 / -62.55	815.47 / +38.92	421.58 / +11.99	397.34 / -12.25	358.32 / +10.56	367.87 / -140.52	277.60 / -28.64	258.86 / -47.38
		Construction	1296.02	106.11 / -371.47	99.00 / -378.58	126.35 / -351.23	163.79 / -313.78	225.04 / +14.78	204.29 / -5.97	86.13 / +29.94	101.79 / -25.66	271.58 / +1.37	293.86 / +23.65
Greater sandhill crane (<i>Grus Canadensis tabida</i>) ST/FP	AGS, DGR, CRP, FEW, IGR, IRH, IRF, LAC, VRI	Project	1666.98	487.07 / -173.92	515.41 / -145.58	497.29 / -163.70	593.38 / -67.60	227.18 / -30.23	262.01 / +4.60	330.02 / +51.24	280.87 / +75.73	9.93 / +1.94	6.99 / -1.00
		Construction	641.72	72.08 / -269.87	62.28 / -279.67	89.38 / -252.58	132.03 / -209.92	173.04 / +8.46	183.21 / +18.62	81.80 / +37.04	38.87 / +20.19	34.73 / -4.12	37.68 / -1.17
Bald eagle (<i>Haliaeetus leucocephalus</i>) Delisted, SE/FP	AGS, BAR, FEW, LAC, RIV, VRI, VOW	Project	470.61	57.83 / +0.95	66.05 / +9.18	74.19 / +17.31	111.59 / +54.71	130.78 / +72.44	137.50 / +79.16	148.85 / -37.83	34.84 / -14.39	32.12 / +11.92	29.71 / +9.51
		Construction	324.07	18.29 / -71.15	14.05 / -75.38	34.09 / -55.35	12.41 / -77.03	10.90 / +5.14	3.75 / -2.01	6.76 / -2.01	6.97 / +1.67	194.53 / -7.90	197.50 / -4.93
Nelson's (San Joaquin) antelope squirrel (<i>Ammospermophilus nelsoni</i>) ST	ASC, AGS, BAR, PAS	Project	184.12	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	59.35 / -60.04	26.30 / -13.21	33.79 / +8.56	30.78 / +5.56
		Construction	206.00	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	2.63 / +0.43	3.62 / +1.47	194.30 / -7.35	197.32 / -4.33
Ringtail (<i>Bassariscus astutus</i>)	AGS, RIV, VRI	Project	0.21	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	0.70 / +0.49	0.70 / +0.49
		Construction	0.10	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	0.30 / +0.21	0.30 / +0.21

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Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives											
			BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid	
				Impact Acreage / Difference Compared to Corresponding BNSF Area ^a										
Fresno kangaroo rat (<i>Dipodomys nitratoides exilis</i>) FE, SE	ASC, AGS, BAR, PAS, VOW	Project	28.16	2.50 / +2.50	2.85 / +2.85	2.50 / +2.50	2.85 / +2.85	— ^C	— ^C	— ^C	— ^C	— ^C	— ^C	
		Construction	4.52	0.17 / -4.32	0.05 / -4.44	0.17 / -4.32	0.05 / -4.44	— ^C	— ^C	— ^C	— ^C	— ^C	— ^C	
Tipton kangaroo rat (<i>Dipodomys nitratoides nitratoides</i>) FE, SE	ASC, AGS, BAR, PAS, VOW	Project	284.54	— ^C	— ^C	— ^C	— ^C	— ^C	— ^C	117.68 / -75.34	27.68 / -12.87	33.79 / +8.56	30.78 / +5.56	
		Construction	208.73	— ^C	— ^C	— ^C	— ^C	— ^C	— ^C	3.84 / +0.60	4.53 / +2.38	194.30 / -7.35	197.32 / -4.33	
San Joaquin kit fox (<i>Vulpes macrotis mutica</i>) FE, ST	Natural (ASC, AGS, BAR, PAS, VOW)	Project	424.34	49.64 / +14.44	57.80 / +22.60	57.43 / +22.23	81.01 / +45.82	101.88 / +67.25	113.21 / +78.58	117.68 / -75.34	27.68 / -12.87	33.79 / +8.56	30.78 / +5.56	
		Construction	310.03	13.78 / -79.22	8.82 / -84.18	14.36 / -78.64	5.87 / -87.13	8.59 / +5.65	1.55 / -1.39	3.84 / +0.60	4.53 / +2.38	194.30 / -7.35	197.32 / -4.33	
	Agricultural (CRP, DGR, DOR, EOR, IGR, IRF, IRH, VIN)	Project	2721.08	670.35 / -283.41	726.13 / -227.63	665.90 / -287.87	765.42 / -188.34	151.65 / -85.83	204.69 / -32.79	399.39 / +35.85	549.80 / -63.09	—	—	
		Construction	1458.41	108.52 / -332.78	104.29 / -337.01	109.48 / -331.82	175.20 / -266.10	328.06 / +7.34	345.44 / +24.72	150.07 / +11.08	324.22 / -201.50	—	—	
	Bakersfield (URB)	Project	239.23	—	—	—	—	—	—	—	—	—	197.33 / -41.90	182.83 / -56.39
		Construction	61.23	—	—	—	—	—	—	—	—	—	69.97 / +8.75	89.65 / +28.42
Other Special-Status Species														
Kern brook lamprey (<i>Lampetra hubbsi</i>) CSC	Friant-Kern Canal (Bakersfield)	Project	0.11	—	—	—	—	—	—	—	—	0.40 / +0.29	0.40 / +0.29	
		Construction	0.09	—	—	—	—	—	—	—	—	0.07 / -0.03	0.07 / -0.03	
Western spadefoot toad (<i>Spea</i> [= <i>Scaphiopus hammondi</i>]) CSC	ASC, AGS, FEW, RIV, VOW	Project	406.32	53.78 / +19.38	62.24 / +27.83	60.13 / +25.73	80.72 / +46.31	95.32 / +54.08	120.07 / +78.84	129.27 / -70.92	30.38 / -3.61	24.69 / +1.68	22.26 / -0.75	
		Construction	62.19	17.29 / +15.16	12.77 / +10.64	17.39 / +15.25	9.64 / +7.50	4.85 / +0.73	3.34 / -0.78	5.15 / +1.32	4.65 / +3.43	37.45 / -2.74	40.44 / +0.25	
Western pond turtle (<i>Actinemys</i> [= <i>Clemmys Emys marmorata</i>]) CSC	AGS, FEW, LAC, PAS, RIV, URB, VRI, VOW	Project	1937.42	282.37 / -7.70	290.12 / +0.04	284.74 / -5.33	329.40 / +39.33	262.01 / +68.72	267.65 / +74.36	183.72 / -83.02	191.29 / -183.07	264.41 / -36.34	245.69 / -55.06	
		Construction	492.33	49.97 / -14.36	47.30 / -17.03	69.13 / +4.81	49.41 / -14.92	48.73 / +2.96	22.86 / -22.91	10.09 / -9.87	70.33 / -52.70	113.38 / +5.53	135.64 / +27.79	
Silvery legless lizard (<i>Anniella pulchra pulchra</i>) CSC	VRI, VOW	Project	2.90	3.30 / +2.24	3.79 / +2.73	3.30 / +2.24	3.79 / +2.73	0.47 / -0.04	0.50 / 0.00	0.47 / -0.66	—	0.70 / +0.49	0.70 / +0.49	
		Construction	0.81	0.91 / +0.59	0.99 / +0.66	0.91 / +0.59	0.99 / +0.66	0.08 / -0.04	0.29 / +0.17	0.02 / -0.24	—	0.30 / +0.21	0.30 / +0.21	

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Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives										
			BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area ^a									
San Joaquin whipsnake (<i>Masticophis flagellum ruddocki</i>) CSC	ASC, AGS, PAS, VRI, VOW	Project	376.78	49.11 / +15.20	57.99 / +24.08	51.04 / +17.14	73.85 / +39.95	76.20 / +48.33	105.52 / +77.65	118.15 / -75.99	27.68 / -3.44	19.66 / +0.86	16.68 / -2.12
		Construction	58.20	14.62 / +8.27	9.55 / +3.20	15.27 / +8.92	6.86 / +0.50	2.70 / +1.14	1.72 / +0.16	3.85 / +0.35	4.53 / +3.45	36.32 / -2.96	39.32 / +0.04
Coast (California) horned lizard (<i>Phrynosoma coronatum frontale</i>) CSC	ASC, AGS, VRI, VOW	Project	262.40	— / -13.88	— / -13.88	4.37 / -9.52	6.67 / -7.21	76.20 / +49.23	103.46 / +76.49	117.67 / -70.79	— ^c	3.73 / +3.38	0.70 / +0.34
		Construction	30.37	— / -0.02	— / -0.02	2.32 / +2.30	0.05 / +0.03	2.70 / +1.14	1.58 / +0.01	3.85 / +0.60	— ^c	20.77 / -2.70	23.77 / +0.29
Western burrowing owl (<i>Athene cunicularia</i>) CSC	ASC, AGS, PAS, BAR, URB, VOW	Project	1900.33	266.13 / +10.46	272.29 / +16.61	271.24 / +15.56	298.61 / +42.94	259.26 / +83.31	249.49 / +73.55	152.47 / -116.48	184.13 / -190.98	279.26 / -32.00	259.93 / -51.34
		Construction	725.24	45.20 / -104.11	42.20 / -107.12	49.06 / -100.26	42.76 / -106.56	52.38 / +7.94	20.63 / -23.81	7.16 / -7.26	67.90 / -53.06	271.35 / +1.92	293.68 / +24.26
SPECIAL-STATUS RAPTOR SPECIES	ASC, AGS, CRP, PAS, VRI, DGR, IGR, IRH, IRF, VOW	Project	1697.35	498.24 / -158.75	528.39 / -128.60	498.88 / -158.11	584.64 / -72.35	218.33 / -30.64	255.34 / +6.37	310.97 / +13.45	276.42 / +77.08	19.66 / +0.86	16.68 / -2.12
		Construction	638.97	72.43 / -275.08	62.39 / -285.11	73.93 / -273.57	130.35 / -217.15	173.04 / +8.49	183.34 / +18.79	80.2 / +40.13	36.56 / +20.88	36.32 / -2.96	39.32 / +0.04
SPECIAL-STATUS PASSERINE SPECIES	ASC, AGS, CRP, PAS, VRI, FEW, LAC, RIV, DGR, IGR, IRH, IRF, VOW	Project	1836.22	515.01 / -177.67	546.03 / -146.65	518.77 / -173.91	622.59 / -70.09	246.76 / -26.32	281.19 / +8.11	349.43 / +13.91	283.58 / +75.56	30.63 / +3.04	28.25 / +0.65
		Construction	661.01	76.36 / -272.80	66.76 / -282.40	93.10 / -256.06	136.01 / -213.15	175.27 / +8.01	185.40 / +18.14	83.12 / +37.18	39.00 / +20.17	39.01 / -3.60	41.96 / -0.65
SPECIAL-STATUS WADING BIRDS, SHOREBIRDS, AND DUCK SPECIES	ASC, AGS, CRP, PAS, DGR, IGR, IRH, IRF, RIV, FEW, LAC	Project	1833.32	511.71 / -179.91	542.24 / -149.38	515.47 / -176.15	618.80 / -72.83	246.29 / -26.28	280.69 / +8.11	348.96 / +14.57	283.58 / +75.56	29.93 / +2.54	27.54 / +0.16
		Construction	660.20	75.44 / -273.39	65.77 / -283.06	92.18 / -256.65	135.03 / -213.81	175.19 / +8.05	185.11 / +17.97	83.10 / +37.43	39.00 / +20.17	38.71 / -3.81	41.66 / -0.86
Pallid bat (<i>Antrozous pallidus</i>) CSC	ASC, AGS, BAR, CRP, DGR, IGR, IRH, IRF, PAS, RIV, URB, VRI, VIN, VOW	Project	3518.84	730.68 / -265.57	760.59 / -235.66	716.90 / -279.35	809.47 / -186.78	393.88 / +12.15	404.13 / +22.41	436.57 / +37.67	440.38 / -67.99	279.02 / -28.92	260.24 / -47.70
		Construction	1392.47	105.95 / -414.64	98.14 / -422.45	107.56 / -413.04	164.93 / -355.66	208.98 / +6.37	204.20 / +1.59	155.10 / +31.94	92.00 / -35.63	263.38 / +1.90	285.70 / +24.23
Dulzura pocket mouse (<i>Chaetodipus californicus femoralis</i>) CSC	AGS, VOW	Project	66.06	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	44.17 / -21.89	— ^c	— ^c	— ^c
		Construction	1.36	— ^c	— ^c	— ^c	— ^c	— ^c	— ^c	2.63 / +1.27	— ^c	— ^c	— ^c

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			BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area ^a									
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>) CSC	ASC, AGS, BAR, CRP, IGR, IRH, IRF, PAS, VRI, URB, VIN RIV, VOW	Project	3651.50	752.66 / -222.38	782.09 / -192.95	755.44 / -219.60	849.40 / -125.65	412.73 / +11.58	409.10 / +7.95	418.42 / +22.75	427.84 / -144.19	287.33 / -29.71	268.55 / -48.50
		Construction	1430.61	108.04 / -419.79	101.00 / -426.83	112.19 / -415.64	171.75 / -356.08	225.04 / +14.81	204.58 / -5.64	154.8 / +29.20	102.09 / -35.72	273.17 / +2.53	295.50 / +24.86
Western mastiff bat (<i>Eumops perotis californicus</i>) CSC	ASC, AGS, BAR, CRP, FEW, IGR, IRH, IRF, PAS, URB, VRI, VIN, VOW	Project	1217.47	— / -69.19	— / -69.19	— / -69.19	— / -69.19	— ^c	— ^c	— ^c	144.40 / -10.41	279.96 / -31.51	260.63 / -50.84
		Construction	436.40	— / -7.68	— / -7.68	— / -7.68	— / -7.68	— ^c	— ^c	— ^c	71.50 / +50.55	271.65 / +2.13	293.99 / +24.46
Western red bat (<i>Lasiurus blossevillei</i>) CSC	AGS, FEW, IRH, LAC, PAS, RIV, URB, VOW, VRI	Project	2283.24	467.08 / +50.90	493.30 / +77.12	504.32 / +88.13	553.89 / +137.70	325.98 / +77.53	344.25 / +95.80	277.53 / -37.12	220.05 / -198.66	264.41 / -36.34	245.69 / -55.06
		Construction	572.01	80.60 / -36.72	74.86 / -42.46	105.16 / -12.16	143.45 / +26.13	72.54 / +2.70	67.34 / -2.50	12.49 / -7.55	73.46 / -49.78	113.38 / +5.53	135.64 / +27.79
Tulare grasshopper mouse (<i>Onychomys torridus tularensis</i>) CSC	ASC, AGS, VRI	Project	335.49	37.23 / +18.39	44.80 / +25.97	44.61 / +25.77	62.68 / +43.85	76.20 / +49.23	103.46 / +76.49	118.08 / -71.95	27.68 / -3.44	18.02 / +0.38	15.04 / -2.61
		Construction	52.52	14.28 / +13.47	9.42 / +8.61	14.93 / +14.13	6.75 / +5.95	2.70 / +1.14	1.58 / +0.01	3.85 / +0.35	4.53 / +3.45	36.23 / -2.94	39.23 / +0.06
American badger (<i>Taxidea taxus</i>) CSC	ASC, AGS, BAR, PAS, VRI, VOW	Project	427.24	51.05 / +14.79	59.70 / +23.44	58.84 / +22.58	82.92 / +46.66	102.35 / +67.21	113.71 / +78.58	118.15 / -75.99	27.68 / -12.87	34.49 / +9.05	31.48 / +6.05
		Construction	310.84	14.70 / -78.63	9.81 / -83.52	15.27 / -78.05	6.86 / -86.47	8.67 / +5.61	1.84 / -1.22	3.85 / +0.35	4.53 / +2.38	194.61 / -7.14	197.63 / -4.12

Attachment 2
Comparison of Impacts on Special-Status Wildlife Species by Alternative

Highlighted text indicates the alternatives and species associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Special-Status Wildlife Species (Common Name/Scientific Name/Status)	CWHR Vegetation Community or Wildlife Association	Impact Type	High-Speed Train Alternatives										
			BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
				Impact Acreage / Difference Compared to Corresponding BNSF Area ^a									

Notes:

— = No impact or not applicable (e.g., alternative does not overlap species range)

(P) = Impacts could occur, elderberry shrubs have not been identified but could occur in natural areas where permission to enter was not available.

Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.

All impacts were calculated based on 15% engineering design construction footprint.

^a The “Difference Compared to Corresponding BNSF Area” represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.

^b Represents the number of locations where elderberry shrubs may be removed.

^c Alternative does not overlap species range.

^d Habitat was recently converted to a solar energy project and annual grassland habitat is low very limited and fragmented within the construction and project footprint.

Impacts on all special-status wildlife species are based on the CWHR determinations of habitats and range, except as follows:

{vernal pool tadpole shrimp and vernal pool fairy shrimp} Disturbances based on vernal pools/seasonal wetlands in the Wetland Study Area. Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.

{elderberry longhorn beetle} Data presented as number of identified elderberry shrubs within Plant Study Area.

{California tiger salamander} Potential aquatic habitat limited to the Corcoran Irrigation Water District; potential upland habitat determined by identifying associated vegetation communities within a 1.24-mile radius of potential aquatic habitat.

{Fresno kangaroo rat} Range limited to the San Joaquin and Kings rivers based on distribution data provided by Brian Cypher, ESRP (Cypher 2010, Personal Communication) and areas potentially suitable to support this species within that range.

{Tipton kangaroo rat} Range data taken from the Endangered Species Recovery Program distribution data. *Tipton Kangaroo Rat* (Dipodomys nitratoides nitratoides) *5-Year Review: Summary and Evaluation* (USFWS 2010)

{San Joaquin kit fox} Disturbances are provided separately for urban communities in the vicinity of Bakersfield. Range is based on CWHR.

{Kern brook lamprey} Impacts are based on disturbances to the Friant-Kern Canal in Bakersfield.

{silvery legless lizard} Potential habitat determined to be all VRI habitat in the Habitat Study Area.

{coast horned lizard } The coast horned lizard was observed in the Allensworth Bypass Alternative during the 2010 field surveys; due to these observations, the species’ range has been extended beyond the range map provided by the CWHR to include both the Corcoran Bypass and Allensworth Bypass alternatives because of the presence of natural habitat areas in these alternatives.

Acronyms and Abbreviations:	Federal Status FE – Endangered FT – Threatened CH – Critical Habitat designated by the U.S. Fish and Wildlife Service BCC – Birds of Conservation Concern designated by the U.S. Fish and Wildlife Service State Status SE – Endangered ST – Threatened CSC – California Species of Special Concern designated by the California Department of Fish and Game FP – Fully Protected species designated by the California Department of Fish and Game
AGS: Annual grassland (includes vernal pools) ASC: Alkali desert scrub (includes vernal pools) BAR: Barren CRP: Cropland DGR: Dryland grain crops DOR: Deciduous orchard EOR: Evergreen orchard FEW: Fresh emergent wetland IGR: Irrigated grain crops IRF: Irrigated row and field crops IRH: Irrigated hayfield LAC: Lacustrine PAS: Pasture VRI: Valley foothill riparian	

Attachment 3
Comparison of Impacts on Special-Status Plant Communities by Alternative

Highlighted text indicates the alternatives and special-status plant communities associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Special-Status Plant Community Type (Common Name/Scientific Name/Status)	Impact Type	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area ^a									
Valley Foothill Riparian (CFGC 1600) ^b	Project	2.90	1.41 / +0.35	1.90 / +0.84	1.41 / +0.35	1.90 / +0.84	0.47 / -0.04	0.50 / -<0.01	0.47 / -0.66	—	0.70 / +0.49	0.70 / +0.49
	Construction	0.81	0.91 / +0.59	0.99 / +0.66	0.91 / +0.59	0.99 / +0.66	0.08 / -0.04	0.29 / +0.17	0.02 / -0.24	—	0.30 / +0.21	0.30 / +0.21
Iodine bush scrub/ <i>Allenrolfea occidentalis</i> Shrubland Alliance G4, S3	Project	6.31	—	—	—	—	—	—	2.90 / -3.42	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Alkali goldenbush scrub/ <i>Isocoma acradenia</i> Shrubland Alliance Not ranked	Project	<0.01	—	—	—	—	—	—	— / -<0.01	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Bush seepweed scrub/ <i>Suaeda moquinii</i> Shrubland Alliance G5, S3.2	Project	15.81	0.24 / +0.24	—	—	—	—	—	0.54 / -13.63	—	—	—
	Construction	0.27	—	—	—	—	—	—	— / -0.27	—	—	—
Saltgrass flats/ <i>Distichlis spicata</i> Herbaceous Alliance G5, S4	Project	2.48	—	—	—	—	0.14 / +0.14	0.04 / +0.04	2.81 / +0.38	—	—	—
	Construction	0.31	—	—	—	—	0.01 / -0.01	0.01 / -0.01	0.06 / +0.06	—	—	—
Fremont cottonwood forest/ <i>Populus fremontii</i> Forest Alliance G4, S3.2	Project	0.37	—	—	—	—	—	—	— / -0.37	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Black willow thickets/ <i>Salix goodingii</i> Woodland Alliance G3, S3	Project	4.73	—	—	—	—	0.46 / -0.07	0.44 / -0.09	1.80 / +1.80	—	0.76 / -3.43	0.76 / -3.43
	Construction	0.91	—	—	—	—	0.08 / -0.04	0.10 / -0.02	0.15 / +0.15	—	— / -0.80	— / -0.80
Red willow thickets/ <i>Salix laevigata</i> Woodland Alliance G3, S3	Project	0.28	—	—	—	—	—	—	— / -0.28	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
Potential suitable habitat that could support special-status plant communities	Project	380.57	42.70 / +0.32	50.96 / +8.59	55.26 / +12.88	88.31 / +45.94	112.01 / +74.17	125.77 / +87.93	156.26 / -29.31	32.48 / +9.98	42.65 / +11.69	39.64 / +8.68
	Construction	241.09	15.13 / +11.36	10.43 / +6.65	31.20 / +27.43	8.64 / +4.86	9.78 / +4.80	2.61 / -2.38	64.97 / +60.83	24.95 / +14.33	202.03 / -6.71	205.05 / -3.68
Total Impact on Special Status Plant Communities	Project	410.56	42.94 / +0.56	50.96 / +8.59	55.26 / +12.88	88.31 / +45.94	112.61 / +74.24	126.25 / +87.88	164.32 / -44.82	32.48 / +9.98	43.41 / +8.26	40.40 / +5.25
	Construction	242.59	15.13 / +11.36	10.43 / +6.65	31.20 / +27.43	8.64 / +4.86	9.87 / +4.75	2.72 / -2.40	65.18 / +60.77	24.95 / +14.33	202.03 / -7.50	205.05 / -4.48

Attachment 3
Comparison of Impacts on Special-Status Plant Communities by Alternative

Highlighted text indicates the alternatives and special-status plant communities associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Special-Status Plant Community Type (Common Name/Scientific Name/Status)	Impact Type	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid

Notes:

— = No impact or not applicable

^a The “Difference Compared to Corresponding BNSF Area” represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.

^b Valley Foothill Riparian Impacts presented in this table are calculated as the areas above the ordinary high water mark to the outer extent of the riparian vegetation dripline. This calculation does not include riparian areas, below or overhanging the ordinary high water mark

^c Excludes Riparian area because of overall with other special-status plants communities.

Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.

All impacts were calculated based on 15% engineering design construction footprint.

Global Rank

G1 = Less than 6 viable element occurrences (EOs) OR less than 2,000 acres.

G2 = 6-20 EOs OR 2,000-10,000 acres.

G3 = 21-100 EOs OR 10,000-50,000 acres.

G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.

G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

State Rank

S1 = Less than 6 EOs OR less than 2,000 acres

S1.1 = very threatened

S1.2 = threatened

S1.3 = no current threats known

S2 = 6-20 EOs OR 2,000-10,000 acres

S2.1 = very threatened

S2.2 = threatened

S2.3 = no current threats known

S3 = 21-100 EOs OR 10,000-50,000 acres

S3.1 = very threatened

S3.2 = threatened

S3.3 = no current threats known

S4 - Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat. NO THREAT RANK.

S5 - Demonstrably secure to ineradicable in California. NO THREAT RANK.

Attachment 4
Comparison of Impacts on Wetlands and Other Waters by Alternative

Highlighted text indicates the alternatives and wetlands and other waters associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Wetlands and Other Waters (TYPE/HST water type)	Impact Type ^A	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area ^B									
WETLANDS TOTAL	Project	16.79	0.27 / +0.25	0.27 / +0.25	0.41 / +0.4	0.39 / +0.38	1.21 / -0.66	1.01 / -0.87	6.02 / -7.12	—	0.51 / -0.11	0.51 / -0.11
	Construction	1.66	0.01 / +0.01	—	0.05 / +0.05	0.04 / +0.04	1.91 / +1.12	0.35 / -0.45	0.03 / -0.55	—	—	—
	Indirect Bisect	14.60	—	—	—	—	— / -0.01	— / -0.01	11.54 / -3.05	—	—	—
	Indirect	84.57	2.26 / +1.26	2.96 / +1.96	4.42 / +3.43	5.27 / +4.28	6.68 / -0.44	1.73 / -5.39	19.92 / -45.84	—	0.09 / -0.04	0.09 / -0.04
Emergent wetland	Project	0.01	— / -0.01	— / -0.01	— / -0.01	— / -0.01	—	—	—	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
	Indirect	0.60	— / -0.60	0.70 / +0.09	1.75 / +1.15	2.59 / +1.99	—	—	—	—	—	—
Seasonal wetland	Project	4.54	0.27 / +0.27	0.27 / +0.27	0.41 / +0.41	0.39 / +0.39	1.2 / -0.67	1.01 / -0.87	0.41 / -0.52	—	0.51 / -0.11	0.51 / -0.11
	Construction	1.66	0.01 / +0.01	—	0.05 / +0.05	0.04 / +0.04	1.91 / +1.12	0.35 / -0.45	0.03 / -0.55	—	—	—
	Indirect	67.41	2.26 / +1.87	2.26 / +1.87	2.67 / +2.28	2.68 / +2.29	6.68 / -0.44	1.72 / -5.41	8.69 / -40.51	—	0.09 / -0.04	0.09 / -0.04
Vernal pools and swales	Project	12.24	—	—	—	—	0.01 / +0.01	—	5.61 / -6.6	—	—	—
	Construction	—	—	—	—	—	—	—	—	—	—	—
	Indirect Bisect	14.60	—	—	—	—	— / -0.01	— / -0.01	11.54 / -3.05	—	—	—
	Indirect	16.56	—	—	—	—	—	0.01 / +0.01	11.23 / -5.33	—	—	—
OTHER WATERS OF THE U.S. TOTAL	Project	122.80	17.77 / -0.07	38.18 / +20.34	17.38 / -0.47	20.96 / +3.11	28.38 / +3.14	14.33 / -10.92	38.46 / +0.46	7.92 / -0.02	11.46 / +3.19	12.11 / +3.84
	Construction	29.71	5.62 / -2.85	7.1 / -1.37	7.38 / -1.08	23.04 / +14.57	1.95 / -1.1	3.17 / +0.12	2.91 / -3.31	1.87 / -1.39	2.43 / -0.85	2.36 / -0.92
	Indirect	284.15	40.96 / -21.71	76.14 / +13.48	39.08 / -23.58	73.27 / +10.61	30.4 / +7.13	30.48 / +7.21	136.68 / +27.03	9.54 / -10.68	29.79 / -8.08	30.11 / -7.76
Canals/Ditches	Project	64.39	16.9 / +6.65	16.31 / +6.07	15.99 / +5.74	14.16 / +3.91	19.03 / +4.36	8.97 / -5.7	11.44 / +0.52	2.99 / -0.08	5.83 / +3.04	6.44 / +3.65
	Construction	9.82	5.12 / +3.69	4.84 / +3.41	6.93 / +5.49	6.79 / +5.36	1.92 / -0.67	3.06 / +0.47	1.28 / +0.58	0.19 / -0.05	1.03 / +0.62	0.99 / +0.58
	Indirect	73.96	24.09 / +11.06	25.02 / +11.99	24.29 / +11.25	24.55 / +11.52	18.6 / +5.62	18.35 / +5.37	24.45 / +1.58	4.53 / -2.65	11.5 / +2.14	12.13 / +2.78
Lacustrine	Project	51.85	0.20 / -4.36	19.93 / +15.36	0.73 / -3.83	4.88 / +0.32	9.07 / -0.5	5.22 / -4.35	26.79 / —	4.93 / +0.06	3.77 / +0.53	3.81 / +0.56
	Construction	18.92	0.03 / -6.82	1.78 / -5.06	— / -6.85	15.79 / +8.94	— / -0.45	0.06 / -0.39	1.6 / -3.8	1.68 / -1.34	1.00 / -1.2	0.97 / -1.23
	Indirect	162.72	9.13 / -16.47	42.67 / +17.06	7.25 / -18.36	40.45 / +14.84	9.98 / +1.32	11.17 / +2.52	110.52 / +25.36	5.00 / -8.02	4.24 / -4.08	3.92 / -4.39

Attachment 4
Comparison of Impacts on Wetlands and Other Waters by Alternative

Highlighted text indicates the alternatives and wetlands and other waters associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Wetlands and Other Waters (TYPE/HST water type)	Impact Type ^A	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area ^B									
Seasonal riverine	Project	6.56	0.67 / -2.37	1.94 / -1.09	0.66 / -2.38	1.92 / -1.11	0.28 / -0.72	0.14 / -0.86	0.23 / -0.06	—	1.86 / -0.38	1.86 / -0.38
	Construction	0.97	0.47 / +0.29	0.47 / +0.29	0.46 / +0.27	0.46 / +0.27	0.03 / +0.03	0.05 / +0.05	0.03 / -0.09	—	0.40 / -0.27	0.40 / -0.27
	Indirect	47.47	7.73 / -16.29	8.45 / -15.58	7.55 / -16.47	8.27 / -15.75	1.83 / +0.19	0.96 / -0.68	1.71 / +0.1	—	14.06 / -6.15	14.06 / -6.15
TOTAL IMPACTS	Project	139.59	18.04 / +0.18	38.45 / +20.59	17.78 / -0.07	21.35 / +3.49	29.6 / +2.48	15.34 / -11.78	44.48 / -6.66	7.92 / -0.02	11.97 / +3.08	12.63 / +3.73
	Construction	31.37	5.63 / -2.83	7.10 / -1.37	7.44 / -1.03	23.08 / +14.61	3.86 / +0.02	3.52 / -0.33	2.94 / -3.85	1.87 / -1.39	2.43 / -0.85	2.36 / -0.92
	Indirect Bisect	14.60	—	—	—	—	— / -0.01	— / -0.01	11.54 / -3.05	—	—	—
	Indirect	368.72	43.21 / -20.45	79.1 / +15.44	43.51 / -20.15	78.55 / +14.88	37.08 / +6.69	32.21 / +1.82	156.59 / -18.8	9.54 / -10.68	29.88 / -8.12	30.20 / -7.8
<div>Notes:</div> <div>— = No impact, no change or not applicable</div> <div>^A Indirect impacts are calculated within a 250-foot buffer of the project footprint, which includes areas of permanent and temporary impacts.</div> <div>^B The “Difference Compared to Corresponding BNSF Area” represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.</div> <div>Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.</div> <div>All impacts were calculated based on 15% engineering design construction footprint.</div>												

Attachment 5
Comparison of Impacts on Conservation Areas by Alternative

Highlighted text indicates the alternatives and conservation areas associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Protected Land Type	Impact Type	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
			Impact Acreage / Difference Compared to Corresponding BNSF Area ^a									
Recovery Plan for Upland Species of the San Joaquin Valley, California (Total)	Project	1,151.62	—	—	—	—	125.99 / -97.40	119.58 / -103.81	306.06 / -1.89	146.27 / +17.43	241.11 / -28.87	222.35 / -47.62
	Construction	682.43	—	—	—	—	348.41 / -1.75	359.93 / +9.78	151.56 / +135.38	35.17 / -13.61	266.15 / +1.31	288.44 / +23.60
Recovery Plan for Upland Species of the San Joaquin Valley, California (Satellite Area)	Project	982.97	—	—	—	—	125.99 / -97.40	119.58 / -103.81	214.66 / -70.91	—	241.11 / -28.87	222.35 / -47.62
	Construction	642.05	—	—	—	—	348.41 / -1.75	359.93 / +9.78	6.78 / -4.18	—	266.15 / +1.31	288.44 / +23.60
Recovery Plan for Upland Species of the San Joaquin Valley, California (Linkage Area ^b)	Project	168.65	—	—	—	—	—	—	91.41 / +69.02	146.27 / +17.43	—	—
	Construction	40.38	—	—	—	—	—	—	144.78 / +139.57	35.17 / -13.61	—	—
Allensworth Ecological Reserve	Project	14.29	—	—	—	—	—	—	— / -14.29	—	—	—
	Construction	1.29	—	—	—	—	—	—	— / -1.29	—	—	—
Metropolitan Bakersfield Habitat Conservation Plan	Project	542.85	—	—	—	—	—	—	—	222.57 / +28.98	290.94 / -29.34	272.20 / -48.08
	Construction	285.04	—	—	—	—	—	—	—	12.18 / -51.36	274.35 / +1.48	296.63 / +23.77
Notes: — = No impact or not applicable Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives. All impacts were calculated based on 15% engineering design construction footprint. ^a The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative. ^b Linkage areas were mapped in the <i>Recovery Plan for Upland Species of the San Joaquin Valley, California</i> . The boundaries of these features are rough-landscape scaled approximations.												

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Attachment 6
Comparison of Impacts on Protected Trees by Alternative

Highlighted text indicates the alternatives and protected trees associated with the Preferred Alternative. The Preferred Alternative includes portions of the BNSF Alternative along with the Corcoran Bypass, Allensworth Bypass, and Bakersfield Hybrid alternatives. The Hanford West alternatives, BNSF-Through Corcoran, Corcoran Elevated, Wasco-Shafter Bypass, BNSF-Bakersfield North, and Bakersfield South alternatives are not part of the Preferred Alternative.

Protected Tree	Impact Type	High-Speed Train Alternatives										
		BNSF Impact Acreage	Hanford West Bypass 1	Hanford West Bypass 1 Modified	Hanford West Bypass 2	Hanford West Bypass 2 Modified	Corcoran Elevated	Corcoran Bypass	Allensworth Bypass	Wasco-Shafter Bypass	Bakersfield South	Bakersfield Hybrid
		Impact Number / Difference Compared to Corresponding BNSF Area ^a										
Eucalyptus species	Project	—	—	—	—	—	—	—	—	—	—	—
	Construction	1	—	—	—	—	—	—	—	—	—	—
Landscape, Ornamental, Non-native	Project	72	6 / +6	15 / +15	6 / +6	15 / +15	—	—	—	— / -2	38 / +15	22 / -1
	Construction	16	3 / +3	3 / +3	3 / +3	3 / +3	—	—	—	—	3 / 0	8 / +5
Oak species	Project	5	20 / +20	20 / +20	20 / +20	20 / +20	4 / +1	4 / +1	—	— / -2	—	—
	Construction	—	6 / +6	6 / +6	6 / +6	6 / +6	—	—	—	—	—	—
Unknown species ^b	Project	117	29 / +19	29 / +19	29 / +19	29 / +19	8 / -3	8 / -3	2 / -4	39 / +37	48 / +21	31 / +4
	Construction	101	3 / +1	2 / 0	3 / +1	2 / 0	2 / -6	— / -8	— / -2	—	4 / -1	3 / -2
TOTAL IMPACTS	Project	194	55 / +45	64 / +54	55 / +45	64 / +54	12 / -2	12 / -2	2 / -4	39 / +33	86 / +36	53 / +3
	Construction	117	12 / +10	11 / +9	12 / +10	11 / +9	2 / -6	— / -8	— / -2	—	7 / -1	11 / +3
<div>Notes:</div> <div>— = No impact or not applicable</div> <div>Impact calculations in this table include alignment alternatives and station alternatives, but do not include HMF alternatives.</div> <div>All impacts were calculated based on 15% engineering design construction footprint.</div> <div>^a The "Difference Compared to Corresponding BNSF Area" represents the difference in impact acreages between an alternative alignment and its corresponding segment in the BNSF Alternative: positive (+) differences indicate that the alternative alignment results in greater impact acres than its corresponding segment in the BNSF Alternative; negative (-) differences indicate that the alternative alignment results in fewer impact acres than its corresponding segment in the BNSF Alternative.</div> <div>^b Clumps of trees identified in the field as "numerous unknown" were estimated to represent 4 trees and counted within the "Unknown species" category.</div>												

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Attachment F

Biological Resources Mitigation Measures

Attachment F

Biological Resources Mitigation Measures

The mitigation measures in this section identify avoidance, minimization, and compensation measures to minimize potential impacts and effects on biological resources (e.g., special-status plant and wildlife species, habitats of concern, wildlife movement corridors, and native flora and fauna) by the HST alternative alignments, station alternatives, and HMF alternatives. Many of these mitigation measures have multiple benefits that avoid, protect, or compensate for the impacts and effects on various biological resources.

Implementation of the mitigation measures can be the responsibility of the Authority or its Design-Build Contractor (Contractor). Monitoring will generally be the responsibility of the Contractor, with oversight provided by the Authority during construction. Long-term mitigation monitoring and compensatory mitigation will be the responsibility of the Authority.

- As the CEQA lead agency and proponent of this project, the Authority will implement the mitigation measures through its own actions, those of its contractors, and actions taken in cooperation with other agencies and entities. The Authority is ultimately accountable for the overall administration of the mitigation monitoring program and for assisting relevant individuals and parties in their oversight and reporting responsibilities. The responsibilities of mitigation implementation, monitoring, and reporting extend to several entities, as outlined in the Mitigation Monitoring Enforcement Plan (MMEP); however, the Authority will bear the primary responsibility for verifying that the mitigation measures are implemented.

Section 3.7.2 presents the regulatory programs that apply to the HST alternatives. Table 3.7-1 addresses the federal requirements and Table 3.7-2 addresses the state requirements. The primary agreements and regulatory requirements include the federal ESA (Section 7), CESA (Section 2081), CWA (Section 404), Porter Cologne Act (Section 401), and State Fish and Game Code (Section 1600).

The mitigation measures presented below were refined in some cases as a result of coordination with federal, state, and local agencies. Representative agencies involved in early coordination include USFWS, USACE, EPA, CDFW, and SWRCB. This coordination effort included consideration of the types, timing, and locations of mitigation measures, including consideration for early implementation, as feasible.

The Authority has been coordinating with the USFWS and CDFW through regular meetings, project-specific site visits, potential mitigation site visits, and permit applications to ensure that proposed mitigation measures are sufficient to address impacts on special-status species and wildlife movement corridors. Comment letters from the California Department of Fish and Wildlife on the mitigation measures have been incorporated into this Final EIR/EIS where feasible and effective. Also, the conservation measures identified in the USFWS Biological Opinion (USFWS 2013a) to avoid, minimize, and reduce potential take of species protected under the federal ESA have been incorporated into this Final EIR/EIS.

Similarly, the Authority has coordinated with EPA and USACE through the Integration Memorandum of Understanding among the FRA, the Authority, USACE, and EPA and the associated Checkpoints and through comment letters received on the Draft EIR/EIS and the Revised DEIR/Supplemental DEIS. These comments were incorporated in this Final EIR/EIS where feasible and effective.

As background, the Memorandum of Understanding established three checkpoints on which the signatory agencies work through the NEPA/Section 404 and Section 408 processes. Coordination

efforts include meetings, conference calls, project and mitigation site visits, and review of technical documents. Checkpoint A established the projects purpose and need. Checkpoint B identified the range of alternatives to be studied in the EIR/EIS. Checkpoint C identified the preliminary Least Environmentally Damaging Practicable Alternative (LEDPA).

The Authority has prepared a number of reports related to Checkpoint C that substantiate the conditions described in the Revised DEIR/Supplemental DEIS and discuss at length the condition of jurisdictional waters in the study area. These documents are publicly available on the Authority's website. These reports are titled *Summary Report*, *Watershed Evaluation Report* (Authority and FRA 2013d) (provided as Appendix 3.7-C), and Appendix A, Evaluation of Wetland Condition Using the California Rapid Assessment Method, of the *Watershed Evaluation Report* (Authority and FRA 2013d) (provided in Appendix 3.7-C). Checkpoint C required a substantial amount of information to evaluate the impacts on aquatic, biological, and other environmental resources. Specifically, Checkpoint C looks closely at both the quantity and the quality of aquatic resources and the associated direct and indirect impacts. This information is presented in detail in the *Watershed Evaluation Report*, which relies on the existing desktop information and a condition assessment conducted in the field.

As discussed in the *Fresno to Bakersfield Section: Watershed Evaluation Report*, the aquatic resource impact profile and the subsequent compensatory mitigation are similar across all seven watersheds, except perhaps the Upper Deer–Upper White Watershed (Authority and FRA 2013d). The Upper Deer–Upper White Watershed contains a significantly greater area of vernal pool landscapes and should be a focus of compensatory mitigation efforts. The Yang, Staffell, Smith Offering, and Davis potential compensatory mitigation properties are all in the Upper Deer–Upper White Watershed.

The 2008 Mitigation Rule states a preference for mitigation using a watershed approach, but acknowledges that for linear projects, where impacts are distributed across multiple watersheds, more ecological functions and values may be created, enhanced, or restored in fewer consolidated mitigation projects. Because of the degraded condition of jurisdictional waters in the region, the focus of compensatory mitigation will be on consolidated mitigation projects because they provide the best opportunity for ecological benefit for the region. Compensatory mitigation may also be consolidated in the watersheds that would experience significant ecological loss of jurisdictional waters in excellent or good condition.

The habitat creation, restoration, and/or revegetation ratios presented here are based upon and ultimately depend on the type of impact (i.e., permanent or temporary), scarcity of the resource, and performance anticipated.

In regards to special-status species, the avoidance, minimization, and mitigation measures are specific to special-status species' known geographic ranges and their suitable habitats, and species-specific measures will not be required when the habitat or range is not located within the construction footprint.

The following roles and definitions represent the Authority, Contractor, and lead biology positions responsible for monitoring, reporting, and implementing the mitigation measures and associated terms and conditions. Other support roles may include restoration ecologists, landscape architects, and special-status species experts.

- **Mitigation Manager:** The Mitigation Manager provided by the Design-Build Contractor is responsible for overseeing the Environmental Team's implementation, reporting, and compliance of all project environmental commitments. The Mitigation Manager will support the construction management team. The Project Biologist will report to the Mitigation Manager to verify compliance with biological resources mitigation measures. The Mitigation

Manager will report the status of each mitigation measure to the Authority in accordance with the MMEP.

- **Project Biologist, Regulatory Specialist (Waters), Project Botanist:** The Project Biologist(s), Regulatory Specialist(s), and Project Botanist(s) provided by the Design-Build Contractor will represent the construction management team, will report directly to the Authority, will implement the mitigation reflected in the construction drawings and specifications, and will be responsible for reporting and overseeing the biological resources mitigation measures from the Final Fresno to Bakersfield Section EIR/EIS. The Project Biologist(s), Regulatory Specialist(s), Project Botanist(s) will also be responsible for implementing mitigation measures in compliance MMEP and with the terms and conditions outlined in the USFWS, USACE, SWRCB, and CDFW permits. The Project Biologist(s) Regulatory Specialist(s), Project Botanist(s) will report to the overall construction management team Mitigation Manager (Mitigation Compliance Manager), interact with the designated Resident Engineer for the Fresno to Bakersfield Section and work to provide quality assurance on the implementation of the biological resources mitigation program as performed by the Contractor and the designated Project Biological Monitor(s). It is anticipated that the Project Biologist(s), Regulatory Specialist(s), and Project Botanist(s) will have specialized support from other biological monitors and work with the Mitigation Manager during deployment of the monitors and in performance of their respective responsibilities.
- **Project Biological Monitor:** The Project Biological Monitor(s) provided by the Design-Build Contractor will be approved by and report directly to the Project Biologist. The Project Biological Monitor will be present onsite, within a reasonable monitoring distance, during all ground-disturbing activities that have the potential to affect biological resources, as directed by the Project Biologist and will be the principal agent(s) in the direct implementation of the MMEP and compliance assurance.

These mitigation measures are based on mitigation strategies from the Statewide Program EIR/EIS, which have been refined and adapted for this proposed project. These mitigation measures will be incorporated into the MMEP and grouped by construction period impacts and project impacts. Construction period mitigation measures include all temporary impacts and effects associated with ground-disturbing activities. Project mitigation measures include all permanent impacts and effects associated with ground-disturbing activities, as well as impacts and effects from HST operation and maintenance activities.

1.1.1.1 Common Mitigation Measures for Biological Resources

The following common mitigation measures shall be implemented, as applicable, during construction period impacts and project impacts on avoid and/or minimize impacts and effects on biological resources. In addition, resource-specific mitigation measures shall be implemented to directly or indirectly avoid or minimize the impacts and effects to the specific biological resource (e.g., special-status species, habitats of concern, and wildlife movement corridor). Many of the common mitigation measures apply throughout the biological resources program and cover multiple species and habitats. The conservation measures identified in the USFWS Biological Opinion (USFWS 2013a) and the Supplemental Biological Assessment (Authority and FRA 2013) to avoid, minimize, and reduce potential take of species protected under the federal ESA have been incorporated into this Final EIR/EIS and include all of the common mitigation measures.

In addition, mitigation measures will be applied as described in Section 3.4, Noise and Vibration; Section 3.15, Parks, Recreation, and Open Space; and Section 3.16, Aesthetics and Visual Resources to avoid and minimize impacts and effects on biological resources. These measures are:

- **N&V-MM#3.** Implement Proposed California High-Speed Train Project Noise Mitigation Guidelines.
- **PC-MM#1.** Compensation for Staging in and Temporary Closures of Park Property During Construction.
- **PP-MM#1.** Acquisition of Park Property.
- **AV-MM#1b.** Minimize Light Disturbance during Construction.

BIO-MM#1. Designate Project Biologist(s), Regulatory Specialist (Waters), Project Botanist, and Project Biological Monitor(s). A Project Biologist will be designated by the Mitigation Manager to oversee regulatory compliance requirements and monitor the restoration activities associated with ground-disturbing activities in accordance with the adopted mitigation measures and applicable laws. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist are responsible for the timely implementation of the biological mitigation measures as outlined in the MMEP, construction documents, and pertinent resource agency permits. Resumes for the Designated Project Biologist(s), Regulatory Specialist(s) (Waters), Project Botanist(s) and Project Biological Monitors(s) must be submitted to the USFWS at least 15 days before the start of construction. Additional duties of the Project Biologist(s), Regulatory Specialist(s) (Waters), and Project Botanist(s) include reviewing design documents and construction schedules, determining project biological monitoring needs, and guiding and directing the work of the Project Biological Monitors.

The duties of the Project Biological Monitor include monitoring construction crew activities, as needed, to document applicable mitigation measures and permit conditions. The Project Biologist(s), Regulatory Specialist(s) (Waters), Project Botanist(s), and the Project Biological Monitor(s) report to the Mitigation Manager. The Project Biologist(s), Regulatory Specialist(s) (Waters), Project Botanist(s) and/or the Project Biological Monitor(s) may require special approval from the USFWS and CDFW to implement certain mitigation measures. In these circumstances, they are referred to as agency-approved biologist(s).

BIO-MM#2. Regulatory Agency Access. If requested, before, during, or on completion of ground-disturbing activities, the Contractor will allow access by USFWS, USACE, SWRCB, and CDFW staff to the construction site. Because of safety concerns, all visitors will be required to check in with the Contractor before accessing the construction site. If agency personnel access the construction site, the Project Biologist will prepare a memorandum within 1 day of the visit to document agency access and the issues raised during the field meeting. This memorandum will be submitted to the Mitigation Manager. Any non-compliance issues will be reported to the Contractor and Authority or its designee.

BIO-MM#3. Prepare and Implement a Worker Environmental Awareness Program (WEAP). Before the start of ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist will prepare and implement a WEAP for construction crews. WEAP training materials will include the following: discussion of the federal Endangered Species Act (federal ESA), the California Endangered Species Act (CESA), the Bald and Golden Eagle Protection Act (BGEPA), the Migratory Bird Treaty Act (MBTA), and the Clean Water Act (CWA); the consequences and penalties for violation or noncompliance with these laws and regulations and project permits; identification of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their value; hazardous substance spill prevention and containment measures; the contact person in the event of the discovery of a dead or injured wildlife species; and review of mitigation measures. In the WEAP, construction timing in relation to species' habitat and life-stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures.

A fact sheet conveying this information will be prepared by the Project Biologist, Regulatory Specialist (Waters), and Project Botanist for distribution to the construction crews and to others who enter the construction footprint. On completion of the WEAP training, construction crews will sign a form stating that they attended the training, understood the information presented, and will comply with the WEAP requirements. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist will submit the signed WEAP training forms to the Mitigation Manager on a monthly basis. Construction crews will be informed during the WEAP training that, except when necessary as determined in consultation with the Project Biologist, Regulatory Specialist (Waters), and Project Botanist travel within the marked project site will be restricted to established roadbeds. Established roadbeds include all pre-existing and project-constructed unimproved and improved roads.

BIO-MM#4. Prepare and Implement a Weed Control Plan and Annual Vegetation Control Plan. A construction-phase Weed Control Plan and an operation phase Annual Vegetation Control Plan will be developed and implemented. Before the start of ground-disturbing activities, the Project Botanist will prepare and implement a Weed Control Plan to minimize or avoid the spread of weeds during ground-disturbing activities.

The Weed Control Plan will address the following:

- Schedule for noxious weed surveys to be conducted in coordination with the Biological Resources Management Plan (BRMP) (BIO-MM#5).
- The success criteria for noxious and invasive weed control, as established by a qualified biologist. The success criteria will be linked to the Biological Resources Management Plan [BRMP] (BIO-MM#5) standards for onsite work during construction. In particular, the criteria will limit the introduction and spread of highly invasive species, as defined by the California Invasive Plant Council (CalIPC), to less than or equal to the pre-disturbance conditions in areas temporarily impacted by construction activities. If invasive species cover is found to exceed by 10% the pre-disturbance conditions during monitoring—or is 10% more compared with a similar, nearby reference site with similar vegetation communities and management—a control effort will be implemented. If the target, or other success criteria identified in the BRMP, has not been met by the end of the monitoring and implementation period, the Authority or its designee will continue the monitoring and control efforts, and remedial actions would be identified and implemented until the success criteria are met. Depending on monitoring results, additional or revised measures may be needed to ensure that the introduction and spread of noxious weeds are not promoted by the construction and operation of the project.
- Provisions to ensure that the development of the Weed Control Plan will be coordinated with development of the Restoration and Revegetation Plan (RRP) (BIO-MM#6) so that the RRP incorporates measures to reduce the spread and establishment of noxious weeds, and incorporates percent cover of noxious weeds into revegetation performance standards.
- Identification of weed control treatments, including the use of permitted herbicides, and manual and mechanical removal methods. Herbicide application will be restricted from use in Environmentally Sensitive Areas and on compensatory mitigation sites, which are defined in BIO-MM#7, Delineate Environmentally Sensitive Area and Environmental Restricted Area (on plans and in field).
- Determination of timing of the weed control treatment for each plant species.
- Identification of fire prevention measures.

During operation, the Authority will generally follow the procedures established in Chapter C2 of the Caltrans Maintenance Manual to manage vegetation on Authority property (Caltrans 2010). Vegetation would be controlled by chemical, thermal, biological, cultural, mechanical, structural, and manual methods. A separate plan, the Annual Vegetation Control Plan, would also be developed each winter for implementation no later than April 1 of each year. That plan would consist of site-specific vegetation control methods, as outlined below:

- Chemical vegetation control noting planned usage.
- Mowing program.
- Other non-chemical vegetation control plans (manual, biological, cultural, thermal [includes the use of propane heat or steam and is not specific to controlled burning] and structural).
- List of sensitive areas, including areas that support special-status plants or host plants for the valley elderberry longhorn beetle, where the vegetation control methods will be limited.
- Other chemical pest control plans (e.g., insects, snail, rodent).

Only Caltrans-approved herbicides will be used in the vegetation control program. Pesticide application will be conducted in accordance with all requirements of the California Department of Pesticide Regulation and County Agricultural Commissioners by certified pesticide applicators. Noxious/invasive weeds will be treated where requested by County Agricultural Commissioners. The Authority will cooperate in area-wide control of noxious/invasive weeds if established by local agencies. Farmers/landowners who request weed control on state right-of-way that is not identified in the annual vegetation control plan will be encouraged to submit a permit request application for weed control that identifies the target weeds and control method desired.

The contractor will implement the Weed Control Plan during the construction period. The Authority or its designee will require that HST maintenance crews follow the guidelines in the Weed Control Plan and Annual Vegetation Control Plan during project operation. The Authority or its designee will appoint the responsible party during the operations period to ensure the Annual Vegetation Control Plan is being carried out appropriately and effectively. A monthly memorandum will be prepared by the Project Botanist to document the progress of the plan and its implementation.

BIO-MM#5. Prepare and Implement a Biological Resources Management Plan. During final design, the Mitigation Manager or designee (Project Biologist, Regulatory Specialist (Waters), or Project Botanist) will prepare the BRMP and assemble the biological resources mitigation measures. The BRMP will include terms and conditions from applicable permits and agreements and make provisions for monitoring assignments, scheduling, and responsibility. The BRMP will also include habitat replacement and revegetation, protection during ground-disturbing activities, performance (growth) standards, maintenance criteria, and monitoring requirements for temporary and permanent native plant community impacts. The parameters for the BRMP will be formed with the mitigation measures from this project-level EIR/EIS, including terms and conditions as applicable from the USFWS, USACE, SWRCB, and CDFW permits.

The goal of the BRMP is to provide an organized reporting tool to ensure that the mitigation measures and terms and conditions are implemented in a timely manner and are reported on. These measures, terms, and conditions include all avoidance, minimization, repair, mitigation, and compensatory actions stated in the mitigation measures or terms and conditions from the permits referenced above. These measures, terms, and conditions are tracked through final design, implementation, and post-construction phases.

The BRMP will help the long-term perpetuation of biological resources within the temporarily disturbed areas and protect adjacent targeted habitats. The BRMP will contain, but not be limited to, the following information:

- a. A master schedule that shows that construction of the project, preconstruction surveys, and establishment of buffers and exclusions zones to protect sensitive biological resources.
- b. Specific measures for the protection of special-status species.
- c. Identification (on construction plans) of the locations and quantity of habitats to be avoided or removed, along with the locations where habitats are to be restored.
- d. Procedures for vegetation analyses of temporarily affected habitats to approximate their relative composition and procedures for site preparation, irrigation, planting, and maintenance. This information may be used to determine the requirements of the revegetation areas for both onsite temporary impacts and offsite compensatory sites.
- e. Sources of plant materials and methods of propagation.
- f. Identification of specific parameters consistent with mitigation ratios and permit conditions for determining the amount of replacement habitat for temporary disturbance areas.
- g. Specification of parameters for maintenance and monitoring of re-established habitats, including weed control measures, frequency of field checks, and monitoring reports for temporary disturbance areas.
- h. Specification of performance standards for the re-established plant communities within the construction limits.
- i. Specification of the remedial measures to be taken if performance standards are not met (e.g., a form of adaptive management).
- j. Methods and requirements for monitoring restoration/replacement efforts, which will be a combination of qualitative and quantitative data consistent with mitigation measures and permit conditions.
- k. Measures to preserve topsoil and control erosion.
- l. Design of protective fencing around Environmentally Sensitive Areas (ESAs), environmentally restricted areas (ERAs), and the construction staging areas.
- m. Specification of the locations and quantities of gallinaceous guzzlers (catch basin/artificial watering structures) and the monitoring of water levels in them.
- n. Locations of trees to be protected as wildlife habitat (roosting sites) and locations for planting replacement trees.
- o. Specification of the purpose, type, frequency, and extent of chemical use for insect and disease control operations as part of vegetative maintenance within sensitive habitat areas.
- p. Specific construction monitoring programs for habitats of concern and special-status species, as needed.
- q. Specific measures for the protection of vernal pool habitat and riparian areas. These measures may include erosion and siltation control measures, protective fencing guidelines, dust control measures, grading techniques, construction area limits, and biological monitoring requirements.
- r. Provisions for biological monitoring during ground-disturbing activities to confirm compliance and success of protective measures. The monitoring procedures will (1) identify specific

locations of wildlife habitat and sensitive species to be monitored; (2) identify the frequency of monitoring and the monitoring methods (for each habitat and sensitive species to be monitored); (3) list required qualifications of biological monitor(s), and (4) identify the reporting requirements.

BIO-MM#6. Prepare and Implement a Restoration and Revegetation Plan. During final design, the Project Botanist will prepare a Restoration and Revegetation Plan (RRP) for temporarily disturbed upland communities. (Site restoration will also be conducted to restore temporary impacts on valley foothill riparian areas [BIO-MM#47] and jurisdictional waters [BIO-MM#48].) In the RRP, impacts on habitat subject to temporary ground disturbances that will require decompaction or re-grading will be addressed, if appropriate. The Project Biologist will approve the seed mix. The standards for onsite work during construction will limit highly invasive species, as defined by the California Invasive Plant Council, to less than 10% greater than the pre-disturbance condition or as determined through a comparison with an appropriate reference site with similar natural communities and management.

During ground-disturbing activities, the Contractor will implement the RRP in temporarily disturbed areas. The Project Botanist will prepare and submit compliance reports to the Mitigation Manager to document implementation and performance of the RRP.

BIO-MM#7. Delineate Environmentally Sensitive Areas and Environmentally Restricted Areas (on plans and in field). Before the start of ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist will verify that ESAs and ERAs are delineated on final construction plans (including grading and landscape plans) and in the field and will update as necessary. ESAs are areas within the construction zone, or on compensatory mitigation sites, containing suitable habitat for special-status species and habitats of concern that may allow construction activities but have restrictions based on the presence of special-status species or habitats of concern at the time of construction. ERAs are sensitive areas that are typically outside the construction footprint that must be protected in place during all construction activities.

Before and during the implementation of ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist will mark ESAs and ERAs with high-visibility temporary fencing, flagging, or other agency-approved barriers to prevent encroachment of construction personnel and equipment. Sub-meter accurate Global Positioning System (GPS) equipment will be used to delineate all ESAs and ERAs. The Contractor will remove ESA and ERA fencing when construction is complete or when the resource has been cleared according to agency permit conditions in the MMEP and construction drawings and specifications. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist will submit a memorandum regarding the field delineation and installation of all ESAs/ERAs to the Mitigation Manager.

BIO-MM#8. Wildlife Exclusion Fencing. The Contractor, under the supervision of the Project Biologist will install wildlife-specific exclusion barriers at the edge of the construction footprint. Exclusion barriers will be made of durable material, regularly maintained, and installed below-grade by the Contractor under the supervision of the Project Biologist. Wildlife exclusion fencing will be installed along the outer perimeter of ESAs and ERAs and below-grade (e.g., 6 to 10 inches below-grade). The design specifications of the exclusion fencing will be determined through consultation with USFWS and/or CDFW. The wildlife exclusion barrier will be monitored, maintained at regular intervals throughout construction, and removed after the completion of major construction activities. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

BIO-MM#9. Equipment Staging Areas. Before the start of ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist will confirm that staging

areas for construction equipment are outside areas of sensitive biological resources, including habitat for special-status species, habitats of concern, and wildlife movement corridors, to the extent feasible. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

BIO-MM#10. Mono-Filament Netting. Before and during the implementation of ground-disturbing activities, the Project Biologist will verify that the Contractor is not using plastic mono-filament netting (erosion-control matting) or similar material in erosion control materials; acceptable substitutes include coconut coir matting, tackified hydroseeding compounds, rice straw wattles (e.g., Earthsaver wattles: biodegradable, photodegradable, burlap), and other reusable erosion, sediment, and wildlife control systems that may be approved by the regulatory agencies (e.g., ERTEC Environmental Systems products). The Project Biologist will submit memoranda to the Mitigation Manager to document compliance with this measure; the memoranda will be submitted monthly or as appropriate throughout project construction.

BIO-MM#11. Vehicle Traffic. During ground-disturbing activities, the Contractor will restrict project vehicle traffic within the construction area to established roads, construction areas, and other designated areas. The Contractor will establish vehicle traffic in locations disturbed by previous activities to prevent further adverse effects, require observance of a 15 mile per hour (mph) speed limit for construction areas with potential special-status species habitat, clearly flag and mark access routes, and prohibit off-road traffic. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure; memoranda will be submitted on a weekly basis or as appropriate throughout project construction.

BIO-MM#12. Entrapment Prevention. To prevent inadvertent entrapment of protected species, the Contractor, under the guidance of the Project Biologist, will cover all excavated, steep-sided holes or trenches more than 8 inches deep at the close of each work day with plywood or similar materials or provide a minimum of one escape ramp per 10 feet of trenching (with slopes no greater than a 3:1) constructed of earth fill or wooden planks. The Project Biologist will thoroughly inspect holes and trenches for trapped animals before leaving the construction site each day.

The Contractor will either screen, cover, or store more than 1 foot off the ground all construction pipe, culverts, or similar structures with a diameter of 3 inches or greater that are stored at the construction site for one or more overnight periods and these pipes, culverts, and similar structures will be inspected by the Project Biologist for wildlife before the material is moved, buried, or capped. The Project Biologist will clear stored material for common and special-status wildlife species before the pipe is subsequently buried, moved, or capped (covered). The Project Biologist will submit memoranda to the Mitigation Manager to document compliance with this measure; the memoranda will be submitted on a weekly basis or as appropriate throughout project construction.

BIO-MM#13. Work Stoppage. During ground-disturbing activities, the Project Biologist, Regulatory Specialist (Waters), and Project Botanist or Project Biological Monitor will halt work in the event that a special-status wildlife species gains access to the construction footprint. This work stoppage will be coordinated with the resident engineer and/or the Authority or its designee. The Contractor will suspend ground-disturbing activities in the immediate construction area where the potential construction activity could result in "take" of special-status wildlife species; work may continue in other areas. Before construction, the Contractor will obtain written permission from CDFW to capture and relocate any non-listed wildlife species from within the project footprint.

The Contractor will continue the suspension until the special-status species individual leaves voluntarily, or is relocated to a release area using USFWS- and/or CDFW-approved handling

techniques and relocation methods, or as required by USFWS or CDFW. The Project Biologist, Regulatory Specialist (Waters), and Project Botanist will submit a memorandum to the Mitigation Manager to document compliance within 1 day of the work stoppage and subsequent action.

BIO-MM#14. "Take" Notification and Reporting. The Contractor's designated Project Biologist, Regulatory Specialist (Waters), Project Botanist, or Project Biological Monitor will immediately notify the Mitigation Manager in the event of an accidental death or injury to a federal- or state-listed species during project activities. The Project Biologist will then notify USFWS and/or CDFW within 24 hours in the event of an accidental death or injury to a federal- or state-listed species during project activities. The Project Biologist will submit a memorandum to the Mitigation Manager to document compliance with this measure. The memorandum will also identify suggested revisions to the construction activities or additional measures that will be implemented to minimize or prevent future impacts.

BIO-MM#15. Post-Construction Compliance Reports. After each construction package, construction phase, permitting phase, or other portion of the HST section as defined by Authority-contractor design/build contracts is completed, the Mitigation Manager, or designee, will submit post-construction compliance reports consistent with the requirements of the protocols of each appropriate agency (e.g., USFWS, CDFW), including compliance with regulatory agency permits. The Mitigation Manager will submit a memorandum to the regulatory agencies to document compliance with this measure. The frequency of the memorandum compilation and submission will be consistent with the requirements in the regulatory agency permits.

1.1.1.2 Construction Period Mitigation Measures

Special-Status Species

In addition to the common mitigation measures (BIO-MM#1 through BIO-MM#15) that apply to all biological resources, specific measures will be implemented to avoid and/or minimize project impacts and effects on special-status species. As applicable, project mitigation measures (BIO-MM#54 through BIO-MM#61; BIO-MM#51 through BIO-MM#53; BIO-MM#66 through BIO-MM#67) may also reduce the impacts on special-status species during the construction period. Furthermore, in some instances mitigation measures associated with habitats of concern and wildlife movement corridors during the construction period and/or project operation may also directly or indirectly avoid and or minimize impacts and effects on special-status species.

The section presents the mitigation measures that will be implemented to avoid and minimize impacts and effects to special-status species during construction period impacts and is organized by species guild.

Special-Status Plant Species and Special-Status Plant Communities

The implementation of the applicable common mitigation measures (BIO-MM#1 through BIO-MM#15) will also directly or indirectly reduce impacts and effects on special-status plant species and special-status plant communities, as applicable. In addition, the following resource-specific mitigation measures are proposed during construction period impacts.

BIO-MM#16. Conduct Protocol-Level Preconstruction Surveys for Special-Status Plant Species and Special-Status Plant Communities. The Project Botanist will conduct protocol-level, preconstruction botanical surveys for special-status plant species and special-status plant communities in all potentially suitable habitats. The surveys will be conducted during the appropriate blooming period(s) for the species before the start of ground-disturbing activities for salvage and relocation activities.

The Project Botanist will mark the locations of all special-status plant species and special-status plant communities observed for the Contractor to avoid. Before the start of ground-disturbing activities, all populations of special-status plant species and special-status plant communities identified during preconstruction surveys within 100 feet of the construction footprint will be protected and delineated by the Contractors (directed by the Project Botanist) as ERAs. As appropriate, the Project Botanist will update the mapping of special-status species or habitats of concern within the construction limits based on resource agency permits.

Portions of the construction footprint that support special-status plant species that will be temporarily disturbed will be restored onsite to preconstruction conditions. Before disturbance, preconstruction conditions, including species composition, species richness, and percent cover of key species will be documented, and photo points will be established.

If special-status plant species cannot be avoided, mitigation for impacts on these species will be documented (density, percent cover, key habitat characteristics, including soil type, associated species, hydrology, topography, and photo documentation of preconstruction conditions) and incorporated into a relocation/compensation program, as defined in BIO-MM#17. The Project Botanist will provide verification of survey results and report findings through a memorandum to the Mitigation Manager to document compliance with this measure.

BIO-MM#17. Prepare and Implement Plan for Salvage, Relocation and/or

Propagation of Special-Status Plant Species. The Project Botanist will prepare a plan before the start of ground-disturbing activities to address monitoring, salvage, relocation, and propagation of special-status plant species. The relocation or propagation of plants and seeds will be performed at a suitable mitigation site approved by the appropriate regulatory agencies, and as appropriate per species. Documentation will include provisions that address the techniques, locations, and procedures required for the successful establishment of the plant populations. The plan will include provisions for performance that address survivability requirements, maintenance, monitoring, implementation, and the annual reporting requirements. Permit conditions issued by the appropriate resource agencies (e.g., USFWS, CDFW) will guide the development of the plan and performance standards. The Project Botanist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Special-Status Wildlife Species

Invertebrates

The implementation of the applicable common mitigation measures (BIO-MM#1 through BIO-MM#15), invertebrate mitigation measures (BIO-MM#55 and BIO-MM#56), and other mitigation measures pertaining to the jurisdictional waters (including vernal pools) and special-status plant communities (including valley foothill riparian areas) will also directly or indirectly reduce project impacts and effects on special-status invertebrate species, as applicable. In addition, the following species-specific mitigation measures are proposed.

Vernal Pool Branchiopods

BIO-MM#18. Conduct Preconstruction Sampling and Assessment for Vernal Pool

Fauna. Before the start of ground-disturbing activities, the Project Biologist will conduct preconstruction aquatic assessment and sampling in seasonal wetlands and vernal pools in the construction footprint. The approved biologists will visit the sites after initial storm events to determine when seasonal wetlands and vernal pools have been inundated. A seasonal wetland/vernal pool is considered to be inundated when it holds greater than 3 cm of standing water 24 hours after a rain event. Approximately 2 weeks after the pools are inundated, the biologists will conduct general aquatic surveys in appropriate seasonal wetland and vernal pool habitats.

The sampling is an assessment that will be useful in understanding the species present and will help guide the implementation of the performance standards to be consistent with BIO-MM#20: Implement and Monitor Vernal Pool Protection. The Project Biologist will submit a report to the Mitigation Manager and Authority or its designee within 30 days of completing the field work. The report will provide the documentation and the results of the sampling, including the results of the data collection and a comparison with the performance standards.

BIO-MM#19. Seasonal Vernal Pool Work Restriction. For seasonal avoidance of special-status vernal pool branchiopods and vernal-pool-dependent species (e.g., vernal pool branchiopods, western spadefoot toads, California tiger salamanders), the Contractor will not work within 250 feet of suitable aquatic habitats (e.g., vernal pools, seasonal wetlands) from October 15 to June 1 (corresponding to the rainy season) or as determined through informal or formal consultation with the USFWS or USACE. Ground-disturbing activities may begin once the habitat is no longer inundated for the season and it is after April 15. If any work remains to be completed after October 15, the Project Biologist will install exclusion fencing and erosion control measures in those areas where construction activities need to be completed. The Project Biologist will document compliance through memoranda to the Mitigation Manager during the establishment of the fencing activities.

BIO-MM#20. Implement and Monitor Vernal Pool Protection. Although all temporary impacts on vernal pools are considered to be permanent and will be mitigated through offsite compensatory mitigation (see BIO-MM#63), vernal pools within the temporary construction footprint that can be avoided will be protected by erecting exclusion fencing.

For impacts on vernal pools within the temporary construction footprint that cannot be avoided, the Contractor, with guidance from the Regulatory Specialist (Waters), will place rinsed gravel within the affected vernal pools and will cover the affected vernal pools with geotextile fabric before the start of ground-disturbing activities to minimize damage to the soils and protect the contours. The Contractor, under the direction of the Regulatory Specialist (Waters), will collect a representative sampling of soils from the vernal pools before initiating ground-disturbing activities within the vernal pools. The representative soil samples will contain viable plant seeds and vernal pool branchiopod cysts to be preserved from the vernal pools. These samples may be incorporated into other vernal pools, as applicable, with USFWS and/or CDFW consultation. The Contractor will implement these measures within temporary impact areas adjacent to or within the construction footprint. Resource agency consultations with the USFWS and USACE will occur as needed and based on permit conditions.

The Regulatory Specialist (Waters) will submit a memorandum on a weekly basis or at other appropriate intervals to the Mitigation Manager to document compliance with this measure.

Because impacts to vernal pools within the temporary construction footprint are considered to be permanent impacts, these impacts will be mitigated through offsite mitigation, as described in BIO-MM#63. The Contractor will obtain approval from USACE and SWRCB before the implementation of the above-described mitigation measures, for any unanticipated temporary impacts on vernal pools.

Valley Elderberry Longhorn Beetle

BIO-MM#21. Implement Avoidance and Minimization Measures for the Valley Elderberry Longhorn Beetle. Before and during the implementation of ground-disturbing activities, the Project Biologist will implement the avoidance and minimization measures detailed in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a). These measures include conducting protocol-level presence/absence surveys for this species, establishing and maintaining appropriate buffer areas around elderberry plants, restricting the use of chemicals that might harm beetles, and mowing restrictions. After ground-disturbing

activities are completed, any damage to temporarily disturbed buffer areas surrounding elderberry shrubs will be restored as detailed in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Reptiles and Amphibians

The common mitigation measures (BIO-MM#1 through BIO-MM#15), Mitigation Measures BIO-MM#56 and BIO-MM#57, and other mitigation measures pertaining to the jurisdictional waters (including vernal pools) will directly and/or indirectly reduce impacts and effects on reptiles and amphibians and will be implemented during construction period impacts as applicable. Also, the following species-specific mitigation measures are proposed to be implemented during the construction period.

Special-Status Reptile and Amphibian Species: Western Spadefoot, Western Pond Turtle, Silvery Legless Lizard, San Joaquin Whipsnake, and Coast Horned Lizard

BIO-MM#22. Conduct Preconstruction Surveys for Special-Status Reptile and Amphibian Species. Before the start of ground-disturbing activities, the Project Biologist will conduct preconstruction surveys in suitable habitats to determine the presence or absence of special-status reptiles and amphibian species within the construction footprint. Surveys will be conducted no more than 30 days before the start of ground-disturbing activities and will be phased with project build-out.

The results of the preconstruction survey will be used to guide the placement of the environmentally sensitive areas, ERAs, and wildlife exclusion fencing. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#23. Conduct Special-Status Reptile and Amphibian Monitoring, Avoidance, and Relocation. During ground-disturbing activities, the Project Biological Monitor will observe all construction activities in habitat that supports special-status reptiles and amphibians. If suitable habitat is present and environmentally sensitive areas are deemed necessary, the Project Biological Monitor will conduct a clearance survey within the area for special-status reptiles and amphibians after wildlife exclusion fencing is installed. If a special-status reptile or amphibian is present during construction, the Contractor will avoid the special-status reptile or amphibian species, except when necessary. Otherwise, the Project Biological Monitor will relocate special-status reptiles or amphibians (other than California tiger salamander) found in the Environmentally Sensitive Area or construction footprint to an area outside the construction area as determined through consultation with USFWS and/or CDFW. If necessary, clearance surveys will be conducted daily. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

California Tiger Salamander

BIO-MM#24. Conduct Protocol and Preconstruction Surveys for California Tiger Salamander. In the annual grassland and pasture habitats in the Cross Creek grassland region, protocol-level surveys will be conducted in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (USFWS and CDFG 2003). The purpose of these surveys will be to determine presence or absence of the California tiger salamander within the study area. The protocol-level surveys will be conducted by an agency-approved biologist designated by the Authority or its designee or the Contractor's designated Project Biologist.

Before the start of ground-disturbing activities, a qualified, agency-approved biologist (designated by the Project Biologist) will conduct visual preconstruction surveys in suitable habitats in the Cross Creek grassland region. Surveys will be conducted no more than 30 days before the start of ground-disturbing activities and will be phased with project build-out.

In the unlikely event that California tiger salamander individuals are found within the project footprint during protocol-level preconstruction surveys, the Authority will contact the USFWS and CDFW to identify appropriate avoidance and minimization measures to be implemented for this species.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#25. Implement Avoidance and Minimization Measures for California Tiger Salamander. The measures listed below will be implemented in the Cross Creek grassland region to avoid and minimize potential adverse effects to this species:

- The Contractor, under the direction of the Project Biologist, will install, maintain, and monitor exclusion fencing along the perimeter of the construction footprint. The Project Biological Monitor will monitor the exclusion fencing installation to document compliance with the terms and conditions of the USFWS Biological Opinion. Exclusion fencing will be composed of a combination of high-visibility construction fence and wildlife exclusion fence. Exclusion fencing must be trenched into the soil at least 4 inches in depth, with the soil compacted against both sides of the fence for its entire length to prevent central California tiger salamanders from passing under the fence. Barriers must be inspected by an USFWS-approved Project Biological Monitor at least twice weekly on non-consecutive days outside of the breeding season. Barriers will be inspected daily following any rain event and during months when juvenile central California tiger salamanders are most likely emigrating from their breeding ponds in search of burrows in surrounding upland habitat. Barriers will be installed by the contractor with turnarounds at any access openings needed in the fencing, to redirect central California tiger salamanders away from openings.
- The Contractor will not conduct construction activities within 250 feet of potential California tiger salamander breeding habitat during the wet season (October 15 through June 1); however, construction activities may begin once the habitat is no longer inundated for the season and it is after April 15.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Blunt-Nosed Leopard Lizard

The blunt-nosed leopard lizard is a California Fully Protected Species. As such, measures must be taken to completely avoid (not just minimize) take of this species.

BIO-MM#26. Conduct Protocol-Level Surveys for Blunt-Nosed Leopard Lizard. The Project Biologist will conduct protocol-level surveys in suitable habitats for the blunt-nosed leopard lizard within 1 year of each construction phase. These surveys will be conducted in areas of potential blunt-nosed leopard lizard habitat in accordance with the *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard* (CDFG 2004). The Project Biologist will submit a memorandum within 30 days after the completion of the protocol-level surveys to the Mitigation Manager to document compliance with this measure.

BIO-MM#27. Phased Preconstruction Surveys for Blunt-Nosed Leopard Lizard. The Project Biologist will conduct visual preconstruction surveys in areas of potential blunt-nosed

leopard lizard habitat no more than 30 days before the ground-disturbing activities associated with each construction phase. The Project Biological Monitor will conduct daily clearance surveys before construction activities. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#28. Blunt-Nosed Leopard Lizard Avoidance. During the active season (April 15 through October 15), in areas where blunt-nosed leopard lizards or blunt-nosed leopard lizard signs are present, the following measures will be implemented:

- Following the phased preconstruction survey for blunt-nosed leopard lizard within the construction footprint (see BIO-MM#27), if active burrows or egg clutch sites are identified within the construction footprint, the Contractor and Project Biologist will establish, maintain, and monitor 50-foot buffers around active burrows and egg clutch sites. The 50-foot buffers will be established around the active burrow and clutch sites in a manner that allows for blunt-nosed leopard lizard to leave the construction footprint after the young have hatched. Project activities within the 50-foot buffers, including vegetation clearing and grubbing (as described below), will be prohibited until the eggs have hatched and blunt-nosed leopard lizard have been allowed to leave the construction footprint, as determined by the Project Biologist.
- Following the phased preconstruction survey for blunt-nosed leopard lizard within the construction footprint (see BIO-MM#27), if no active burrows or egg clutch sites are identified within the construction footprint, the Contractor, under the direction of the Project Biologist, will conduct vegetation clearing and grubbing activities with hand tools. Cleared vegetation will be cut to 4 inches above the ground level, and all trimmings will be removed from the construction footprint. The vegetation-free work area will be allowed to sit undisturbed for a minimum of 72 hours to allow blunt-nosed leopard lizards to passively relocate from the site. A follow-up preconstruction survey will be conducted in the vegetation-free work area to look for blunt-nosed leopard lizards or their sign. Any blunt-nosed leopard lizards observed during the follow-up survey will be allowed to leave the work site on their own accord. Immediately after the follow-up preconstruction survey of the vegetation-free work area, the construction footprint will be delineated with high-visibility construction fence and a wildlife exclusion fence with "a non-gaping, non-climbable barrier using a rigid and non-climbable material." The vegetation-free work area within the wildlife exclusion fence will be maintained by the Contractor and monitored daily by the Project Biologist.
- The Contractor will conduct ground-disturbing activities when air temperatures are between 75 and 95 degrees Fahrenheit. The temperature range corresponds to the period when this species is moving around and can avoid danger.

During the non-active season (October 16 through April 14), suitable blunt-nosed leopard lizard burrows identified during protocol-level and preconstruction surveys will be avoided by the Contractor. A 50-foot no-work buffer will be established around burrows to prevent impacts until the active season, when blunt-nosed leopard lizards will be able to leave the vegetation-free work area on their own accord. The no-work buffer will be established by routing the high-visibility construction fence and wildlife exclusion fence around the suitable burrow sites in a manner that allows for a connection between the burrow site and the suitable natural habitat adjacent to the footprint so that blunt-nosed leopard lizard individuals are able to leave the construction footprint during the active season. If construction activities are required during this period, the appropriate measures will be established through consultation with USFWS and CDFW.

Non-disturbance exclusion zones will be maintained by the Contractor and monitored by USFWS-approved biological monitor(s) to avoid the possibility for take of lizards, their burrows/nests, or the species habitat outside of the project footprint.

If blunt-nosed leopard lizards are observed at any time during protocol-level surveys, phased preconstruction surveys, or during construction, USFWS and CDFW will be contacted. Appropriate measures to avoid take of the species will be established through consultation with the USFWS and CDFW. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Fish

The common mitigation measures (BIO-MM#1 through BIO-MM#15) will directly and/or indirectly reduce impacts and effects on special-status fish species. The common mitigation measures will be implemented during the construction period, as applicable.

Birds

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and project-period mitigation measures (BIO-MM#58 and BIO-MM#59) will directly and/or indirectly reduce impacts and effects on special-status bird species including those protected under the MBTA and/or listed as species of special concern (SSC) by the CDFW. These mitigation measures will be implemented during project operation as applicable. In addition, the following species-specific mitigation measures are proposed for implementation during the construction period.

BIO-MM#29. Conduct Preconstruction Surveys and Delineate Active Nest Exclusion Areas for Other Breeding Birds. Before the start of ground-disturbing activities, the Project Biologist will conduct visual preconstruction surveys where suitable habitats are present for nesting birds protected by the MBTA if construction and habitat removal activities are scheduled to occur during the bird breeding season (February 1 to August 15). In the event active bird nests are encountered during the preconstruction survey, the Project Biologist in conjunction with the Contractor will establish nest avoidance buffer zones as appropriate. The buffer distances will be consistent with the intent of the MBTA. The Project Biologist will delineate nest avoidance buffers established for ground-nesting birds in a manner that does not create predatory bird perch points in close proximity (150 feet) to the active nest site. The Project Biologist or Biological Monitor will periodically monitor active bird nests. The Project Biologist will maintain the nest avoidance buffer zone until nestlings have fledged and are no longer reliant on the nest or parental care for survival or the nest is abandoned (as determined by the Project Biologist). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#30. Conduct Preconstruction Surveys and Monitoring for Raptors. No more than 14-days before the start of ground-disturbing activities, the Project Biologist will conduct visual preconstruction surveys where suitable habitats are present for nesting raptors if construction and habitat removal activities are scheduled to occur during the bird-breeding season (February 1 to August 15). Surveys will be conducted in areas within the construction footprint and, where permissible, within 500 feet of the construction footprint for raptor species (not Fully Protected species) and 0.5 mile of the construction footprint for Fully Protected raptor species. The required survey dates will be modified based on local conditions.

If breeding raptors with active nests are found, the Project Biologist in conjunction with the Contractor will establish a 500-foot buffer around the nest to be maintained until the young have fledged from the nest and are no longer reliant on the nest or parental care for survival or the nest fails (as determined by the Project Biologist).

If fully protected raptors (e.g., white tailed-kite) with active nests are found, the Project Biologist in conjunction with the Contractor will establish a 0.5-mile buffer around the nest to be maintained until the young have fledged from the nest or the nest fails (as determined by the Project Biologist). Adjustments to the buffer(s) will require prior approval by USFWS and/or CDFW. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#31. Bird Protection. During Final Design, the Project Biologist will verify that the catenary system, masts, and other structures such as fencing are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (APLIC 2012). The Project Biologist will check the final design drawings and submit a memorandum to the Mitigation Manager to document compliance with this measure.

Swainson's Hawks

BIO-MM#32. Conduct Protocol and Preconstruction Surveys for Swainson's Hawks.

The Project Biologist will conduct preconstruction surveys for Swainson's hawks as described in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee [SHTAC] 2000). Surveys will be performed during the nesting season (March 1 through August 1) in the year before ground-disturbing activities within the construction footprint and within a 0.5-mile buffer, where access is permitted. The preconstruction nest surveys following the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000) will be phased with project build-out. The preconstruction surveys will determine the status (i.e., active, inactive) of observed nests. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#33. Swainson's Hawk Nest Avoidance and Monitoring. If active Swainson's hawk nests (defined as a nest used one or more times in the last 5 years) are found within 0.5-mile of the construction footprint during the nesting season (March 1 to August 1), the active nests within the 0.50-mile buffer of the construction footprint will be monitored daily by the Project Biological Monitor to assess whether the nest is occupied. If the nest is occupied, the health and status of the nest will be monitored until the young fledge or for the length of construction, whichever occurs first. The Project Biologist in conjunction with the Contractor will implement buffers restricting construction activities, following CDFW's *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California* (CDFG 1994). Adjustments to the buffer(s) may be made in consultation with CDFW. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#34. Monitor Removal of Nest Trees for Swainson's Hawks. Before the start of ground-disturbing activities, the Project Biological Monitor will monitor nest trees for Swainson's hawks in the construction footprint following the guidelines and methods presented in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (SHTAC 2000). If an occupied Swainson's hawk nest must be removed, the Authority will obtain take authorization through a Section 2081 Incidental Take Permit (including compensatory mitigation to offset the loss of the nest tree) from CDFW. If ground-disturbing activities or other project activities may cause nest abandonment by a Swainson's hawk or forced fledging within the specified buffer area, monitoring of the nest site by the Project Biological Monitor will be conducted to determine if the nest is abandoned. Removal of nesting trees outside of the nesting season (generally between October 1 and February 1) does not require authorization under the Section 2081 Incidental Take Permit. The Project Biologist will submit a

memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Burrowing Owls

BIO-MM#35. Conduct Protocol Surveys for Burrowing Owls. Before the start of ground-disturbing activities a qualified, agency-approved biologist, designated by the Project Biologist, will conduct protocol-level surveys in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012c). The Project Biologist or designee will conduct these surveys at appropriate timeframes within suitable habitat located in the construction footprint. Results of the surveys will be used to inform BIO-MM#36. These surveys will be conducted within suitable habitat of the construction footprint and within a 150-meter (approximately 500-foot) buffer. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#36. Burrowing Owl Avoidance and Minimization. The Contractor, under the direction of the Project Biologist, will implement burrowing owl avoidance and minimization measures following CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). During the nesting season (February 1 through August 31) occupied burrowing owl burrows will not be disturbed unless it is verified that either the birds have not begun egg-laying and incubation or the juveniles from the occupied burrows are foraging independently and are capable of independent survival (as determined by the Project Biologist).

Unless otherwise authorized by CDFW, the Project Biologist in conjunction with the Contractor will establish buffers (as an ESA) between the construction work area and occupied burrowing owl nesting sites as described in Table 3.7-19. Adjustments to the buffer(s) will require prior approval by CDFW.

Table 3.7-19

California Department of Fish and Wildlife recommended restricted activity dates and setback distances by level of disturbance for burrowing owls

Location	Time of Year	Level of Disturbance		
		Low	Medium	High
Nesting Sites	April 1–Aug 15	200 m	500 m	500 m
Nesting Sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting Sites	Oct 16-March 31	50 m	100 m	500 m

Eviction of burrowing owls outside the nesting season may be permitted pending evaluation of eviction plans and receipt of formal written approval from the CDFW authorizing the eviction. If burrowing owls must be moved from the project area, the Project Biologist will undertake passive relocation measures, including monitoring, in accordance with CDFW's (CDFG 2012) guidelines.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Mammals

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and project mitigation measures (BIO-MM#60) will directly and/or indirectly reduce impacts and effects on special-status mammals and will be implemented during the construction period as applicable. The

following species-specific mitigation measures are proposed during construction period impacts. Before construction, the Contractor will obtain written permission from CDFW to capture and relocate any non-listed mammals.

Nelson's Antelope Squirrel, Fresno Kangaroo Rat, Tipton Kangaroo Rat, Dulzura Pocket Mouse, Tulare Grasshopper Mouse

BIO-MM#37. Conduct Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse. Before the start of construction, the Project Biologist will conduct a habitat assessment in potentially suitable habitat within the project footprint to determine presence of special-status small mammal species burrows or their signs. During the habitat assessment a visual survey for the Nelson's Antelope squirrel will be conducted. The habitat assessment survey and visual survey for Nelson's Antelope squirrel will be conducted within 2 years before the start of construction or ground-disturbing activities.

Before the start of construction or ground-disturbing activities, but no more than 14 days before, pre-construction surveys for Nelson's Antelope squirrel, which will include identification of any new burrow complexes, will be conducted within potentially suitable habitat. The pre-construction surveys will be phased with project build-out. If no observations, burrows, or signs of special-status small-mammal species are detected, no further measures will be required.

If burrows and signs of special-status small mammal species are observed, the qualified, agency-approved biologist designated by the Project Biologist will conduct protocol-level surveys in accordance with *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats* (USFWS 2013b) or, in the case of Nelson's Antelope squirrel, as required through consultation with the CDFW.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#38. Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse.

If during the habitat assessment, pre-construction surveys, or protocol-level surveys, observations, burrows, or other signs of special-status small mammal species are detected, the Contractor, under the supervision of the Project Biologist, will establish non-disturbance exclusion zones (using wildlife exclusion fencing [e.g., a silt fence or similar material]). Non-disturbance exclusion zones will be established at least 14 days before the start of ground-disturbing activities. The non-disturbance exclusion fence with one-way exit/escape points will be placed to exclude the special-status small mammals from the construction area. The one-way exit/escape points will be established around burrows in a manner that allows special-status small-mammal species to leave the construction footprint.

Additional measures will be implemented based on the conservation measures and terms and conditions of the USFWS Biological Opinion and the CDFW Section 2081 permit. These measures may include the following:

- The Contractor will trim and clear vegetation to the ground by hand or using hand-operated equipment to discourage the presence of special-status small-mammal species in the construction footprint. The cleared vegetation will remain undisturbed by project construction equipment for 14 days to allow species to passively relocate through the one-way exit/escape points along the wildlife exclusion fencing.
- Relocation of captured individuals will occur in accordance with a USFWS- and CDFW-approved Capture and Relocation Plan. Capture and relocation of special-status small-mammal species will occur before the start of construction and will be phased with project

build-out. These activities will be limited to the evenings when the nightly low temperature is forecast to exceed 50°F.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#39. Implement Avoidance and Minimization Measures for Fresno Kangaroo Rat. Before the start of ground-disturbing activities, a qualified agency-approved biologist, designated by the Project Biologist, will conduct a habitat assessment within the species historic range, on any parcels within the project footprint that may support the Fresno kangaroo rat (e.g., natural habitats including annual grasslands) to determine presence of kangaroo rat burrows or their signs.

If no burrows or signs of kangaroo rats are detected and kangaroo rats are confirmed to be absent from the construction footprint, the following actions will be implemented:

- The Contractor, under the supervision of Project Biologist, will install, maintain, and monitor exclusion fencing along the perimeter of the construction footprint to ensure that no take of Fresno kangaroo rat or destruction of its potential habitat outside of the project footprint occurs.

In the event that kangaroo rat individuals, their burrows, or signs of them are found within the project footprint during the habitat assessment, the Authority and FRA will prepare a Survey Plan that will be submitted to the USFWS and CDFG for review and approval.

With agency approval of the Survey Plan, small-mammal trapping will be conducted by the Contractor's qualified agency-approved and 10(a)(1)(A) permitted biologist(s). Trapping is necessary to distinguish between the kangaroo rat species that may be present. The range of Fresno kangaroo rat in the project footprint overlaps with the more common Heerman's kangaroo rat (*Dipodomys heermanni*). The trapping surveys will be conducted in accordance with the *Survey Protocol for Determining Presence of San Joaquin Kangaroo Rats* (USFWS 2013b) or as determined in consultation with both USFWS and CDFW and will be limited to the evenings when the nightly low temperature is forecast to exceed 50°F.

Depending on the results of the trapping surveys, one of the following will be implemented:

- In the unlikely event that Fresno kangaroo rats are confirmed within the project footprint, no construction activities will be permitted within 250 feet of the occupied areas and ESA fencing will be erected. The Authority and FRA will reinitiate consultation with the USFWS and CDFW to identify appropriate avoidance and minimization measures. The avoidance and minimization measures may include construction work windows, establishment of buffers, and dedicated biological monitoring. On completion of consultation with the USFWS and CDFW, construction may commence and the ESA may be removed.

Or,

- If Fresno kangaroo rats are not identified following the trapping surveys, construction activities may proceed as described above (installation of wildlife exclusion fencing) and implementation of avoidance and minimization measures.

The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Special-Status Bats

BIO-MM#40. Conduct Preconstruction Surveys for Special-Status Bat Species. Before the start of ground-disturbing activities, a qualified, agency-approved biologist, designated by the Project Biologist, will conduct a visual and acoustic preconstruction survey for roosting bats. A minimum of one day and one evening will be included in the visual preconstruction survey. The Project Biologist, in coordination with the Mitigation Manager, will contact CDFW if any hibernation roosts or active nurseries are identified within or immediately adjacent to the construction footprint, as appropriate. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#41 Bat Avoidance and Relocation. During ground-disturbing activities, if active or hibernation roosts are found, the Contractor will avoid them, if feasible, for the period of activity. If avoidance of the hibernation roost is not feasible, the Project Biologist will prepare a relocation plan and coordinate the construction of an alternative bat roost with CDFW. The Contractor, under the direction of the Project Biologist, will implement the Bat Roost Relocation Plan before the commencement of construction activities.

The Contractor, under the supervision of the Biological Monitor, will remove roosts with approval from CDFW before hibernation begins (October 31), or after young are flying (July 31), using exclusion and deterrence techniques described in BIO-MM#42, below. The timeline to remove vacated roosts is between August 1 and October 31. All efforts to avoid disturbance to maternity roosts will be made during construction activities. The Project Biologist will submit a memorandum to the Mitigation Manager, on a weekly basis or at other appropriate intervals, to document compliance with this measure.

BIO-MM#42. Bat Exclusion and Deterrence. During ground-disturbing activities, if non-breeding or non-hibernating individuals or groups of bats are found within the construction footprint, the Project Biologist will direct the Contractor to safely exclude the bats by either opening the roosting area to change the lighting and air-flow conditions or installing one-way doors or other appropriate methods specified by CDFW. The Contractor will leave the roost undisturbed by project activities for a minimum of 1 week after implementing exclusion and/or eviction activities. The Contractor will not implement exclusion measures to evict bats from established maternity roosts or occupied hibernation roosts. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

American Badger

BIO-MM#43. Conduct Preconstruction Surveys for American Badger and Ringtail. Before the start of ground-disturbing activities, the Project Biologist will conduct preconstruction surveys for den sites within suitable habitats in the construction footprint. These surveys will be conducted no more than 30 days before the start of ground-disturbing activities and phased with project build-out. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#44. American Badger and Ringtail Avoidance. The Contractor, under the direction of the Project Biologist, will establish a 50-foot buffer around occupied dens. The Project Biologist will establish a 100-foot buffer around maternity dens through the pup-rearing season (American badger: February 15 through July 1; Ringtail: May 1 through June 15). Adjustments to the buffer(s) will require prior approval by CDFW as coordinated by the Project Biologist, under the supervision of the Mitigation Manager. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

San Joaquin Kit Fox

BIO-MM#45. Conduct Preconstruction Surveys for San Joaquin Kit Fox. Before the start of ground-disturbing activities, the Project Biologist will conduct preconstruction surveys in accordance with USFWS' *Standardized Recommendations for Protection of the San Joaquin Kit Fox prior to or during Ground Disturbance* (USFWS [1999] 2011).

Preconstruction surveys for the kit fox will be conducted within the study area in suitable habitat areas (alkali desert scrub, annual grassland, pasture, barren, and compatible-use agricultural lands) to identify known or potential San Joaquin kit fox dens. Preconstruction surveys will be conducted by a USFWS-approved project biologist within 30 days, but no less than 14 days, before the start of construction or ground-disturbing activities and will be phased with project build-out. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#46. Minimize Impacts on San Joaquin Kit Fox. The Contractor, under the direction of the Project Biologist, will implement USFWS' *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS [1999] 2011), the conservation measures and terms of the conditions of the USFWS Biological Opinion and CDFW 2081 permit to minimize ground-disturbance-related impacts on this species. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Habitats of Concern

In addition to the common mitigation measures (BIO-MM#1 through BIO-MM#15) that apply to all biological resources, specific measures will be implemented to avoid and/or minimize impacts on habitat of concern, including special-status plant communities, jurisdictional waters, conservation areas, and protected trees. As applicable, project mitigation measures (BIO-MM#61 through BIO-MM#64) may also reduce the impact on habitats of concern during construction period impacts. Furthermore, in some instances mitigation measures associated with special-status species and wildlife movement corridors during the construction period and/or project operation may also directly or indirectly avoid and/or minimize impacts and effects to habitats of concern.

This section presents the mitigation measures that will be implemented to avoid and minimize impacts and effects to habitats of concern during construction period impacts and is organized into the following subheadings: special-status plant communities, jurisdictional waters, conservation areas, and protected trees.

Special-Status Plant Communities

The implementation of the applicable common mitigation measures (BIO-MM#1 through BIO-MM#15), and other construction period and project operation mitigation measures pertaining to special-status plant species, special-status plant communities, and jurisdictional waters (BIO-MM#16, BIO-MM#53 and BIO-MM#61 through BIO-MM#63) will directly or indirectly reduce impacts and effects on special-status plant communities during the construction period. In addition, the following resource-specific mitigation measure is proposed to be implemented during construction.

BIO-MM#47. Restore Temporary Riparian Impacts. During post-construction, the Contractor, under the direction of the Project Botanist, will revegetate all disturbed valley foothill riparian areas using appropriate plants and seed mixes. The Project Botanist will monitor restoration activities consistent with provisions in the RRP, as described in BIO-MM#6. The Project Botanist will submit a memorandum, on a weekly basis or at other appropriate intervals,

to the Mitigation Manager documenting compliance and other reporting requirements required by the regulatory agency permits (e.g., 1600 Streambed Alteration Agreement).

Jurisdictional Waters

The implementation of the applicable common mitigation measures (BIO-MM#1 through BIO-MM#15), and project jurisdictional waters mitigation measures (BIO-MM#62 and BIO-MM#63) will also directly or indirectly reduce impacts and effects on jurisdictional waters during construction period impacts. In addition, the following resource-specific mitigation measures are proposed during construction period impacts.

BIO-MM#48. Restore Temporary Impacts on Jurisdictional Waters. During or after the completion of construction, the Contractor, under the direction of the Regulatory Specialist (Waters) and Project Botanist, will restore disturbed jurisdictional waters to original topography using stockpiled and segregated soils. In areas where gravel or geotextile fabrics have been placed to protect substrate and minimize impacts on jurisdictional waters, these materials will be removed and affected features will be restored. The Contractor, under the supervision of the Project Botanist, will conduct revegetation using appropriate plants and seed mixes. The Authority will conduct maintenance monitoring consistent with the provisions in the RRP (BIO-MM#6). The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#49. Monitor Construction Activities within Jurisdictional Waters. During ground-disturbing activities, the Regulatory Specialist (Waters) and Project Biological Monitor will conduct monitoring within and adjacent to jurisdictional waters, including monitoring of the installation of protective devices (silt fencing, sandbags, fencing, etc.), installation and/or removal of creek crossing fill, construction of access roads, vegetation removal, and other associated construction activities. The Project Biological Monitor will conduct biological monitoring to document adherence to habitat avoidance and minimization measures addressed in the project mitigation measures, including, but not limited to, the provisions outlined in BIO-MM#5, BIO-MM#7, BIO-MM#8, BIO-MM#10, BIO-MM#12 through BIO-MM#15, BIO-MM#47, and BIO-MM#48. The monitor will also document adherence to all relevant conservation measures as listed in the USFWS, CDFW, SWRCB, and USACE permits. The Regulatory Specialist (Waters) will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

Conservation Areas

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and other mitigation measures pertaining to the special-status species, habitats of concern, and wildlife movement and migration will also directly or indirectly reduce impacts and effects on conservation areas including Allensworth Ecological Reserve.

Protected Trees

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and the project mitigation measure for protected trees (BIO-MM#64) will also directly and/or indirectly reduce impacts and effects on protected trees during construction period impacts. In addition, the following resource-specific mitigation measure is proposed during construction period impacts.

BIO-MM#50. Mitigation and Monitoring of Protected Trees. Before, during, and after construction, the following methods to preserve and/or mitigate for impacts on protected trees will be implemented:

- A qualified arborist, designated by the Project Botanist, will conduct surveys before removal or disturbance to evaluate the condition of all protected trees found within areas directly and indirectly affected by the Fresno to Bakersfield Section.
- The Authority will compensate for impacts and effects to protected tree resources, including removal or trimming of protected trees (naturally occurring native and landscape or ornamental trees) (see BIO-MM#64, Compensate for Impacts on Protected Trees).
- The Contractor will fence protected trees that may be indirectly affected by construction activities 5 feet from their drip lines to form ERAs.
- The Authority will prepare and implement a monitoring and maintenance program that monitors transplanted trees for re-establishment of root systems.

The Project Botanist will submit a memorandum to the Mitigation Manager to document compliance with this measure.

Wildlife Movement Corridors

In addition to the project design features, the common mitigation measures (BIO-MM#1 through BIO-MM#15) that apply to all biological resources and specific measures will be implemented to avoid and/or minimize impacts and effects on wildlife movement corridors. Furthermore, in some instances the mitigation measures associated with special-status species and habitats of concern during construction period impacts and project impacts may also directly or indirectly avoid and/or minimize impacts and effects to wildlife movement corridors. This avoidance or minimization of impacts may particularly be the case with the compensatory mitigation measures.

As discussed in Chapter 2, Alternatives, wildlife crossing opportunities will be available through a variety of engineered structures, including dedicated wildlife crossing structures, elevated structures, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60- to 120-inch] culverts and paired 30-inch culverts). For a more detailed discussion of the crossing structures, including figures depicting the frequency and locations of these structures, refer to Figures 5-7a through 5-7c and Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

This section presents the mitigation measures that will be implemented to avoid and minimize impacts and effects to wildlife movement corridors during the construction period.

BIO-MM#51. Install Flashing or Slats within Security Fencing. During construction, the Contractor, under the direction of the Project Biologist, will install permanent security fencing consistent with the final design along portions of the project that are adjacent to wildlife movement corridors and natural habitats (e.g., alkali desert scrub, annual grassland). The security fencing will be enhanced with flashing or slats for 6 inches below ground surface to 12 inches above to prevent special-status reptiles and mammals from moving into the right-of-way. The fencing with flashing or slats will be maintained during operation of the HST project. The Project Biologist will verify that the installation is consistent with the designated terms and conditions in the applicable permits. The design of the reptile and mammal-proof fencing and the exact locations where reptile and mammal-proof fencing will be installed will be determined in consultation with USFWS and CDFW.

The Project Biologist will submit a memorandum, on a yearly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

BIO-MM#52. Construction in Wildlife Movement Corridors. Before final design, the Project Biologist will conduct analysis using a GIS habitat model to identify likely wildlife travel corridors and anthropogenic barriers (such as highways, canals, and reservoirs) at the landscape level. The study will be used to further refine crossing locations within linkages in the Allensworth area (i.e., the SR 43/SR 155 and Deer Creek–Sand Ridge linkages) by locating movement opportunities, where possible, adjacent to existing natural areas. The study will not reduce the number of dedicated wildlife movement structures or reduce the openness factor below 0.41.

The study will take into account the proximity of dedicated wildlife movement structures to other wildlife crossing opportunities available through a variety of engineered structures, including elevated structures, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60- to 120-inch] culverts and paired 30-inch culverts). The results of the study and the subsequent final design and locations will be submitted to the Mitigation Manager, the Authority, USFWS, and CDFW.

Before the start of ground-disturbing activities, the Project Biologist will submit a construction avoidance and minimization plan for wildlife movement linkages (e.g., SR 43–Garces Highway and Deer Creek–Sand Ridge linkages, Kern River linkage) to the Mitigation Manager for concurrence. The plan will limit construction and avoid permanent fencing in wildlife movement linkages where the viaducts (e.g., elevated platforms) or bridges are included in the final design. The Contractor will minimize ground-disturbing activities within the wildlife linkages (e.g., SR 43–Garces Highway and Deer Creek–Sand Ridge linkages) during nighttime hours to the extent practicable. The Contractor will also keep nighttime illumination (e.g., for security) from spilling into the linkages or shield nighttime lighting to avoid illumination spilling into the linkages. Inspections by the Project Biologist will verify compliance with this measure. The Project Biologist will submit a memorandum, on a weekly basis or at other appropriate intervals, to the Mitigation Manager to document compliance with this measure.

1.1.1.3 Project Mitigation Measures

Special-Status Species

In addition to the common mitigation measures (BIO-MM#1 through BIO-MM#15) that apply to all biological resources, specific measures will be implemented to avoid and/or minimize project impacts and effects on special-status species. As applicable, construction period mitigation measures (BIO-MM#16 through BIO-MM#52) may also reduce the impact on special-status species during project operation. Furthermore, in some instances mitigation measures associated with habitats of concern and wildlife movement corridors during the construction period or project operation may also directly or indirectly avoid or minimize impacts and effects on special-status species.

The section presents project impact mitigation measures that will be implemented to avoid and minimize impacts and effects to special-status species and is organized by species type (e.g., reptiles, birds, mammals). The mitigation ratios presented in this section are proposed as a minimum to compensate for project impacts; final ratios will be determined in consultation with appropriate agencies.

Special-Status Plant Species

The implementation of the applicable common mitigation measures (BIO-MM#1 through BIO-MM#15) and special-status plant construction mitigation measures (BIO-MM#16 and BIO-MM#17) will directly or indirectly reduce impacts and effects on special-status plant species, as

applicable. Also, the following species-specific mitigation measure for project impacts is proposed.

BIO-MM#53. Compensate for Impacts on Special-Status Plant Species. Before final design, the Authority will mitigate the impacts on special-status plants in accordance with the USFWS Biological Opinion (USFWS 2013a) by implementing the following measures:

Compensation for federally listed plant species that are observed within the project footprint and that cannot be avoided will be compensated at a 1:1 ratio based on actual acres of direct effects by the following:

- a. Identification of suitable sites to receive the listed plants.
 - i. Pixley National Wildlife Refuge, Allensworth Ecological Reserve/State Historic Park, Kern National Wildlife Refuge, Atwell Island, Alkali Sink Ecological Reserve, Semitropic Ecological Reserve, and Kern Water Bank.
 - ii. Authority-proposed permittee-responsible mitigation sites.
 - iii. Other locations approved by USFWS.
- b. Collection of seeds, plant materials, and top soil from the project footprint before construction impacts.

The Authority or its designee will submit a memorandum to the USFWS to document compliance with this measure.

Special-Status Wildlife Species

Invertebrates

The implementation of the applicable common mitigation measures (BIO-MM#1 through BIO-MM#15), invertebrate construction mitigation measures (BIO-MM#18 through BIO-MM#21), and other mitigation measures pertaining to the jurisdictional waters (including vernal pools) and special-status plant communities (including valley foothill riparian areas) will also directly or indirectly reduce project impacts and effects on special-status invertebrate species, as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects during project operation.

Vernal Pool Branchiopods

BIO-MM#54. Compensate for Impacts on Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp. The Authority will mitigate direct and indirect impacts, including temporary and permanent, on vernal pool branchiopod habitat through compensation determined in consultation with the USFWS and USACE. Compensation for vernal pool branchiopod habitat (e.g., vernal pools, seasonal wetlands) is addressed under compensation for impacts on jurisdictional waters (BIO-MM#63). The Authority or its designee will submit a memorandum to the USFWS to document compliance with this measure.

Valley Elderberry Longhorn Beetle

BIO-MM#55. Compensate for Impacts on Valley Elderberry Longhorn Beetle. The Authority will provide compensatory mitigation for the valley elderberry longhorn beetle, including transplantation and replacement of elderberry shrubs and maintenance for replacement shrubs following the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999a). Consistent with the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* and the USFWS Biological Opinion (USFWS 2013a), the performance criteria include a minimum survival

rate of at least 60% of the elderberry plants, and 60% of the associated native plants must be maintained throughout the monitoring period. If survival drops below 60%, failed plantings shall be replaced (USFWS 1999a). The Authority or its designee will submit a memorandum to the USFWS to document compliance with this measure.

Reptiles and Amphibians

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and mitigation measures developed for implementation (BIO-MM#22 through BIO-MM#28) during project construction will directly and/or indirectly reduce impacts and effects on reptiles and amphibians and will be implemented during project operation as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects during project operation.

California Tiger Salamander

BIO-MM#56. Compensate for Impacts on California Tiger Salamander. If compensatory mitigation is required to offset the loss of habitat for California tiger salamander, the Authority will determine the compensation through consultation with the USFWS. Compensatory mitigation could include one of the following:

- Purchase of credits from an agency-approved mitigation bank.
- Fee-title-acquisition of natural resource regulatory agency-approved property.
- Purchase or establishment of a conservation easement with an endowment for long-term management of the property-specific conservation values.
- In-lieu fee contribution determined through negotiation and consultation with USFWS.

The Authority or its designee will submit a memorandum to the USFWS, and CDFW to document compliance with this measure.

Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel

BIO-MM#57. Compensate for Impacts on Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel. The Authority will determine compensatory mitigation to offset the permanent and temporary loss of suitable habitat for the blunt-nosed leopard lizard, Tipton kangaroo rat, and Nelson's antelope squirrel through consultation with the USFWS and/or CDFW. Compensatory mitigation could include one of the following:

- Purchase of credits from an agency-approved mitigation bank.
- Fee-title-acquisition of natural resource regulatory agency-approved property.
- Purchase or establishment of a conservation easement with an endowment for long-term management of the property-specific conservation values.
- In-lieu fee contribution determined through negotiation and consultation with USFWS.

The Authority or its designee will submit a memorandum to the USFWS, and or CDFW to document compliance with this measure.

Fish

The common mitigation measures (BIO-MM#1 through BIO-MM#15) will directly and/or indirectly reduce impacts and effects on special-status fish species. The common mitigation measures will be implemented to avoid and minimize impacts and effects during project operation, as applicable.

Birds

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and construction period mitigation measures (BIO-MM#29 through BIO-MM#36) will directly and/or indirectly reduce impacts and effects on special-status bird species including those protected under the MBTA and/or listed as SSC by the CDFW. These mitigation measures will be implemented during the construction period as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects to birds during project operation.

Swainson's Hawks

BIO-MM#58. Compensate for Loss of Swainson's Hawk Nesting Trees. To compensate for the loss of foraging habitat in proximity to occupied Swainson's hawk nest trees, the Authority will provide project specific compensatory mitigation that replaces nesting trees and provides natural lands for foraging.

Compensatory mitigation for Swainson's hawk will be based on the *Staff Report Regarding Mitigation for Impacts on Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* (CDFG 1994). If project construction occurs within 0.5 mile of a documented or observed active nest, the Authority will provide compensatory mitigation based on the amount of suitable foraging habitat within 1 mile (1:1 ratio), 1 to 5 miles (0.75:1 ratio), and 5 to 10 mile (0.5:1 ratio).

At a minimum, the habitat preserved will contain trees suitable to support nesting and or natural foraging habitat for Swainson's hawk. The Authority or its designee will submit a memorandum to the CDFW to document compliance with this measure.

Burrowing Owls

BIO-MM#59. Compensate for Loss of Burrowing Owl Active Burrows and Habitat. To compensate for permanent impacts on nesting, occupied, and satellite burrows and/or burrowing owl habitat, the Authority will provide compensatory mitigation based on CDFW's (CDFG 2012) *Staff Report on Burrowing Owl Mitigation*. The Authority or its designee will submit a memorandum to the CDFW to document compliance with this measure.

Mammals

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and construction mitigation measures (BIO-MM#37 through BIO-MM#46) will directly and/or indirectly reduce impacts and effects on mammals, and will be implemented during project operation as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects to mammals during project operation.

San Joaquin Kit Fox

BIO-MM#60. Compensate for Destruction of San Joaquin Kit Fox Habitat. The Authority will mitigate the destruction of San Joaquin kit fox habitat by the purchase of suitable, approved habitat through consultation with USFWS and CDFW. For consistency with the USFWS Biological Opinion (USFWS 2013a), San Joaquin kit fox habitat will be replaced to provide additional protection and habitat in a location that is consistent with the recovery of the species. The ratio for compensatory mitigation required to replace the loss of potentially suitable habitat for the San Joaquin kit fox is based on where the habitat is located in relationship to the satellite and linkage areas, as provided in Table 3.7-20. The Authority will mitigate the impacts on San Joaquin kit fox in accordance with the USFWS Biological Opinion as presented in Table 3.7-20 of that document (USFWS 2013a) and/or CDFW 2081(b). The Authority or its designee will submit a memorandum to the USFWS and CDFW to document compliance with this measure.

Table 3.7-20
San Joaquin kit fox habitat compensation ratios

San Joaquin kit fox Area	Habitat	Mitigation Ratio
Southwestern Tulare County Satellite Areas	Natural	3:1
	Developed	0.5:1
Metropolitan Bakersfield Satellite Area	Natural	3:1
	Developed	0.1:1
Recovery Plan-Linkage	Natural	3:1
	Developed	0.5:1
Other Areas (outside of Recovery Areas)	Natural	2:1
	Developed	0.1:1
Note: "Natural" habitat includes: alkali desert scrub, annual grasslands, pasture, barren, and valley oak woodland habitats. "Developed" habitat includes: agricultural lands (croplands, dryland grain fields, irrigated grain fields, irrigated row crops, orchards, hayfields, and vineyards) and urban areas.		

Habitats of Concern

In addition to the common mitigation measures (BIO-MM#1 through BIO-MM#15) that apply to all biological resources, specific measures will be implemented to avoid and/or minimize impacts and effects on habitat of concern, including special-status plant communities, jurisdictional waters, conservation areas, and protected trees during project operation. As applicable, construction mitigation measures (BIO-MM#47 through BIO-MM#50) may also reduce the impact on habitats of concern during construction. Furthermore, in some instances mitigation measures associated with special-status species and wildlife movement corridors during the construction period and/or project operation may also directly or indirectly avoid and/or minimize impacts and effects on habitats of concern.

The section presents the mitigation measures that will be implemented to avoid, minimize, and compensate for impacts and effects to habitats of concern during project operation; this section addresses the following topics: special-status plant communities, jurisdictional waters, conservation areas, and protected trees.

Special-Status Plant Communities

The implementation of the applicable common mitigation measures (BIO-MM#1 through BIO-MM#15), and special-status plant species and special-status plant communities construction mitigation measures (BIO-MM#16, BIO-MM#17, and BIO-MM#47), and other mitigation measures pertaining to the jurisdictional waters (including vernal pools) will also directly or indirectly reduce impacts and effects on special-status plant communities during project operation, as applicable. In addition, the following species-specific mitigation measures are proposed to avoid and minimize impacts and effects to special-status plant communities during project operation.

BIO-MM#61. Compensate for Permanent Riparian Impacts. The Authority will compensate for permanent impacts on riparian habitats (i.e., valley foothill riparian), as determined in consultation with the appropriate agencies (e.g., CDFW, SWRCB), by restoring nearby areas to suitable habitat and/or by purchasing credits in a mitigation bank. The Comprehensive Mitigation and Monitoring Plan will provide the planning details. Compensation

will be based on the following ratio (acres of mitigation to acres of impact), pending agency confirmation:

- Valley Foothill Riparian: 2:1.

The Authority or its designee will submit a memorandum to the CDFW and/or SWRCB to document compliance with this measure.

Jurisdictional Waters

The implementation of the applicable common mitigation measures (BIO-MM#1 through BIO-MM#15), and jurisdictional waters mitigation measures (BIO-MM#48 and BIO-MM#49) will also directly or indirectly reduce impacts and effects on jurisdictional waters during project operation. In addition, the following species-specific mitigation measure is proposed to avoid and minimize impacts and effects to jurisdictional waters during project operation.

BIO-MM#62. Prepare and Implement a Site-Specific Comprehensive Mitigation and Monitoring Plan. As part of the USFWS, USACE, SWRCB, and CDFW permit applications and before the start of ground-disturbing activities, the Authority will prepare a Comprehensive Mitigation and Monitoring Plan (CMMP) to mitigate for temporary and permanent impacts on biological resources (i.e., special-status wildlife, jurisdictional waters, and riparian areas). In the CMMP, performance standards, including percent cover of native species, survivability, tree height requirements, wildlife utilization, the acreage basis, restoration ratios, and the combination of onsite and/or offsite mitigation will be detailed; preference will be given to conducting the mitigation within the same HUC-8 or HUC-6 watershed where the impact occurs. The Authority or its designee will work with the USACE, SWRCB, and CDFW to develop appropriate avoidance, minimization, mitigation, and monitoring measures to be incorporated into the CMMP. The CMMP will outline the intent to mitigate for the lost conditions, functions, and values of impacts on jurisdictional waters and state streambeds consistent with resource agency requirements and conditions presented in Sections 404 and 401 of the CWA and Section 1600 of the CFGC. The CMMP will incorporate the following standard requirements consistent with USACE, SWRCB, and CDFW guidelines:

- Description of the project impact/site.
- Goal(s) (i.e., functions and values or conditions) of the compensatory mitigation project.
- Description of the proposed compensatory mitigation site.
- Implementation plan for the proposed compensatory mitigation site.
- Maintenance activities during the monitoring period.
- Monitoring plan for the compensatory mitigation site.
- Completion of compensatory mitigation.
- Financial assurances.
- Contingency measures.

Also, the following will be included at a minimum for the implementation plan:

- Site analysis for appropriate soils and hydrology.
- Site preparation specifications based on site analysis, including but not limited to grading and weeding.
- Soil and plant material salvage from impact areas, as appropriate to the timing of impact and restoration as well as the location of restoration sites.
- Specifications for plant and seed material appropriate to the locality of the mitigation site.
- Specifications for site maintenance to establish the habitats, including but not limited to weeding and temporary irrigation.

Habitat preservation, enhancement, and/or establishment or restoration activities will be conducted on some of the compensatory (i.e., selected permittee-responsible) mitigation sites to achieve the mitigation goals. A detailed design of the mitigation habitats will be created in coordination with the permitting agencies and be described in the CMMP. It is recognized that several CMMPs will be developed consistent with the selected mitigation sites and the resources mitigated at each. The primary engineering and construction contractors will ensure, through coordination with the Project Biologist, that construction is implemented in a manner that minimizes disturbance of such areas. Temporary fencing will be used during construction to avoid sensitive biological resources that are located adjacent to construction areas and can be avoided.

Performance standards are targets for determining the effectiveness of the mitigation and assessing the need for adaptive management (e.g., mitigation design or maintenance revisions). The performance standards are developed so that progress towards meeting final success criteria can be assessed on an annual basis; the standard for each year is progressively closer to the final criteria (e.g. vegetation cover standards may increase annually until reaching the success criteria objective in the final year of monitoring). Success criteria are formal criteria that must be met after a specific timeframe to meet regulatory requirements of the permitting agencies. Where applicable, replacement planting/seeding will be implemented if monitoring demonstrates that performance standards or success criteria are not met during a particular monitoring interval.

The performance standards will be used to determine whether the habitat improvement is trending toward sustainability (i.e., reduced human intervention) and to assess the need for adaptive management. These standards must be met for the habitat improvement to be declared successful, both during a particular monitoring year and at the end of the establishment period. These performance standards will be developed in consultation with the permitting agencies and described in the CMMP.

The final success criteria will be developed in coordination with the regulatory agencies and presented in the CMMP. Examples of success criteria, which could be included in the CMMP, and would be assessed at the end of the monitoring period (assumed to be 5 years or as directed by agencies), include:

- Percent survival of planted trees (65–85%, depending on species and habitat).
- Percent absolute cover of highly invasive species, as defined by the California Invasive Plant Council (<5%).
- Percent total absolute cover of plant species (50-80%, depending on habitat type).
- Designed wetlands will meet U.S. Army Corps of Engineers criteria for hydrophytic vegetation, hydric soils, and hydrology as defined in the "Corps of Engineers wetland delineation manual" (Environmental Laboratory 1987).
- Designed vernal pools and seasonal wetlands will meet inundation and seasonal drying requirements as specified in the design and indicated by agencies.
- Species composition and community diversity, relative to reference sites, and/or as described in the guidelines issued by permitting agencies (e.g., USFWS conservation guidelines for valley elderberry longhorn beetle).

Performance standards and success criteria will be provided for each of the years of monitoring and will be specific to habitat types at each permittee-responsible mitigation site. The monitoring schedule will be detailed in the site-specific CMMPs. To be deemed successful, the site will be required to meet the performance standards established for the year in which monitoring is being conducted (e.g., monitoring conducted at intervals with increasing performance requirements).

However, if performance standards are not met in specific years, remedial measures, such as regrading, adjustment to modify the hydrological regime, and/or replacement planting or seeding, must be implemented and that year's monitoring must be repeated the following year until the performance standards are met. The success criteria specified must be reached without human intervention (e.g., irrigation, replacement plantings) aside from maintenance practices described in the site-specific CMMPs for maintenance during the establishment period.

The Authority or its designee will oversee the implementation of all CMMP elements and monitor consistent with the prescribed maintenance and performance monitoring requirements.

The Authority or its designee will prepare annual monitoring reports for 5 years (or less if success criteria are met as described earlier) and/or other documentation prescribed in the resource agency permits. The Authority or its designee will submit a memorandum to the regulatory agencies to document compliance with this measure.

BIO-MM#63. Compensate for Permanent and Temporary Impacts on Jurisdictional Waters. The Authority will mitigate permanent and temporary wetland impacts through compensation determined in consultation with the USACE, SWRCB, USFWS, and CDFW, in order to be consistent with the CMMP (BIO-MM#62). Regulatory compliance for jurisdictional waters includes relevant terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and CDFW 1600 Streambed Alteration Agreement.

Compensation shall include jurisdictional waters restoration, establishment, enhancement, or preservation through one or more of the following methods:

- Purchase of credits from an agency-approved mitigation bank.
- Fee-title-acquisition of natural resource regulatory agency-approved property.
- Permittee-responsible mitigation through the establishment, re-establishment, restoration, enhancement, or preservation of jurisdictional waters and the establishment of a conservation easement or other permanent site protection method, along with financial assurance for long-term management of the property-specific conservation values.
- In lieu fee contribution determined through negotiation and consultation with the various natural resource regulatory agencies.

The following ratios are proposed as a minimum for compensation for permanent impacts; final ratios will be determined in consultation with the appropriate agencies:

- Vernal pools: 2:1.
- Seasonal wetlands: between 1.1:1 and 1.5:1 based on impact type and function and values lost.
 - 1:1 offsite for permanent impacts.
 - 1:1 onsite and 0.1:1 to 0.5:1 offsite for temporary impacts.

The Authority will mitigate impacts on jurisdictional waters by replacing, creating, restoring, enhancing or preserving aquatic resource at the ratios presented above or other ratios, as determined in consultation with the appropriate agencies, which compensates for functions and values lost. The Authority will consider modifying the vernal pool mitigation ratios in the final permits based on site-specific conditions and the specific life history requirements of vernal pool branchiopods, California tiger salamander, and western spadefoot toad.

Where an HST alternative affects an existing conservation area (e.g., Allensworth ER), the Authority will modify the mitigation ratio to meet the vernal pool mitigation requirement. Either

the affected portion of the conservation area will be relocated or compensation will be provided to the holder of Allensworth ER in accordance with the Uniform Relocation and Real Property Policy Act of 1970, as amended.

Through the CMMP reporting program and the applicable terms and conditions from the USACE 404 Permit, SWRCB 401 Permit, and the CDFW 1600 Streambed Alteration Agreement, the Authority or its designee will document compliance and submit it to the regulatory agencies.

Conservation Areas

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and other mitigation measures pertaining to the special-status species, habitats of concern, and wildlife movement corridors will also directly or indirectly reduce impacts and effects on conservation areas (e.g., Allensworth ER).

Protected Trees

The common mitigation measures (BIO-MM#1 through BIO-MM#15) and construction mitigation measure for protected trees (BIO-MM#50) will also directly and/or indirectly reduce impacts and effects on protected trees during project operation. In addition, the following species-specific mitigation measure is proposed to avoid and minimize impacts and effects to protected trees during project operation.

BIO-MM#64. Compensate for Impacts on Protected Trees. The Authority will compensate for impacts, including removal or trimming of naturally occurring native protected trees and landscape or ornamental protected trees, in accordance with the local regulatory body (city or county government). The local regulations and laws allow for a number of potential mitigation opportunities. The Authority will provide mitigation commensurate with the regulations and laws in that jurisdiction such that the resulting impact on protected trees is less than significant and may include, but is not limited to, the following, depending on the local jurisdiction:

- Transplant directly affected protected trees that are judged by an arborist to be in good condition to a suitable site outside the zone of impact.
- Replace directly affected protected trees at an onsite or offsite location, based on the number of protected trees removed, at a ratio not to exceed 3:1 for native trees or 1:1 for landscape or ornamental trees.
- Contribute to a tree-planting fund.

The Authority or its designee will submit a memorandum to the local regulatory body to document compliance with this measure.

Wildlife Movement Corridors

As applicable, construction period mitigation measures (BIO-MM#51 and BIO-MM#52) and common mitigation measures (BIO-MM#1 through BIO-MM#15) that apply to all biological resources may also reduce the impact on wildlife movement corridors during project operation.

Furthermore, mitigation measures associated with special-status species and habitats of concern during the construction period and/or project operation may also directly or indirectly avoid and/or minimize impacts and effects on wildlife movement corridors. This avoidance or minimization of impacts may specifically be the case for the compensatory mitigation, which will focus on preservation of natural habitats in wildlife movement linkages and corridors.

As discussed in Chapter 2, wildlife crossing opportunities would be available through a variety of engineered structures, including dedicated wildlife crossing structures, viaducts, bridges over riparian corridors, road overcrossings and undercrossings, and drainage facilities (i.e., large-diameter [60–120 inches] culverts and paired 30-inch culverts). For a more detailed discussion of the crossing structures, including figures depicting the frequency and locations of these structures, see Figures 5-7a through 5-7c and Section 5.6 of the *Fresno to Bakersfield Section: Biological Resources and Wetlands Technical Report* (Authority and FRA 2012a).

Offsite Habitat Restoration, Enhancement, and Preservation

BIO-MM#65: Offsite Habitat Restoration, Enhancement, and Preservation. Before site preparation at a mitigation site, the Authority will consider the offsite habitat restoration, enhancement, and preservation program and identify short-term temporary and/or long-term permanent effects on the natural landscape. A determination will be made on any effects from the physical alteration of the site to onsite biological resources, including plant communities, land cover types, and the distribution of special-status plant and wildlife.

Appropriate seasonal restrictions (e.g., breeding season) on activities that result in physical alteration of the site may be applicable if suitable habitats for special-status species and sensitive habitats exist onsite. Activities resulting in the physical alteration of the site include grading/modifications to onsite topography, stockpiling, storage of equipment, installation of temporary irrigation, removal of invasive species, and alterations to drainage features. In general, the long-term improvements to habitat functions and values will offset temporary effects during restoration, enhancement, and preservation activities.

The offsite habitat restoration, enhancement, and preservation program will be designed, implemented, and monitored in ways that are consistent with the terms and conditions of the USACE Section 404 Permit, CDFW 1600 Streambed Alteration Agreement, and CESA and federal ESA as they apply to their jurisdiction and resources onsite. Potential effects on site-specific hydrology and the downstream resources will be evaluated as a result of implementation of the restoration-related activity. Site-specific BMPs and a Storm Water Pollution Prevention Plan (SWPPP) will be implemented as appropriate.

The Authority will report on compliance with the permitting requirements. The Authority or its designee will be responsible for the monitoring and tracking of the program, will prepare a memorandum of compliance, and will submit it to the appropriate regulatory agency.